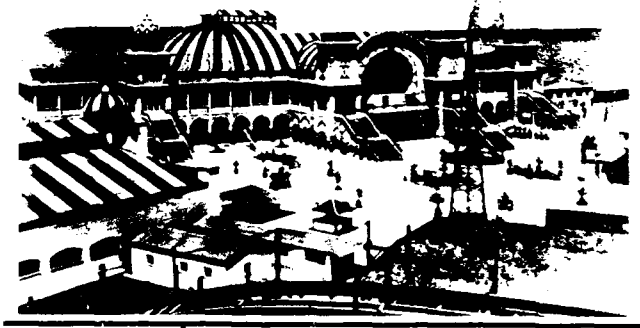
WEST DESERT PUMPING PROJECT

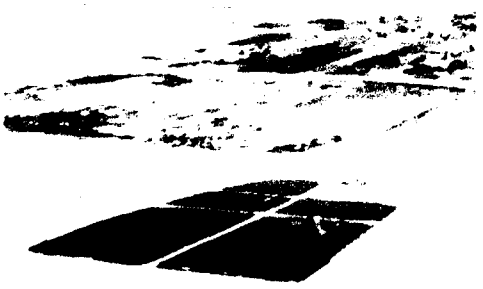
AD-A213 209

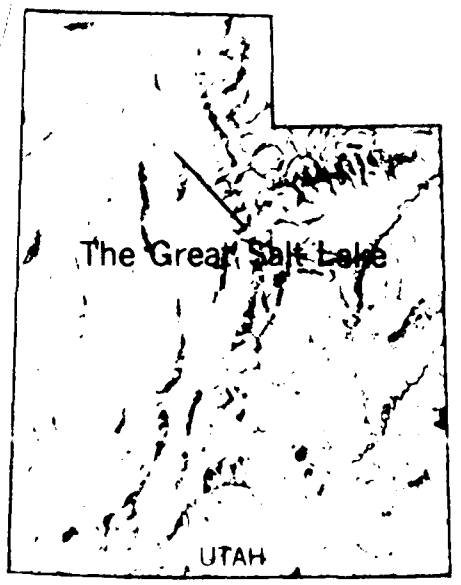
Final
Environmental Impact Statement

Bureau of Land Management
Salt Lake District Office
Salt Lake City, Utah

July, 1986







IN REPLY REFER TO:

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
SALT LAKE DISTRICT OFFICE
2370 South 2300 West
Salt Lake City, Utah 84119

1792
(U-022)

Dear Reader:

Enclosed is the Final Environmental Impact Statement (EIS) for the West Desert Pumping Project. The Salt Lake District, Bureau of Land Management, in cooperation with the United States Air Force and the United State Army Corps of Engineers has prepared this document in conformance with the requirements of the National Environmental Policy Act of 1969.

This Final EIS is designed to be used in conjunction with the Draft EIS which was published in February, 1986. This document contains the revisions and corrections pertaining to the Draft EIS, public comments received, and BLM's responses to those comments.

Thank you for your participation in this process.

Sincerely yours,

Deane H. Zeller

Deane H. Zeller
District Manager

Enclosure
Final Pumping Project EIS

DEPARTMENT OF THE INTERIOR

FINAL ENVIRONMENTAL IMPACT STATEMENT FOR THE WEST DESERT PUMPING PROJECT

Prepared By
BUREAU OF LAND MANAGEMENT
DEPARTMENT OF THE INTERIOR

Roland Robinson

UTAH STATE DIRECTOR

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PREFACE

PREFACE

The purpose of this final environmental impact statement (EIS) is to supplement the draft EIS which was published February 10, 1986. Together, the draft and final EISs incorporate the analyses of the environmental consequences resulting from construction and operation of the West Desert Pumping Project or Diking to Protect Critical Facilities.

This final EIS, in conjunction with the draft EIS, forms the complete EIS for the project. This final EIS contains a revised Summary and a variety of new material, as well as public comments on the draft EIS and responses to those comments. Chapter 1 contains analyses of the changes that have occurred to the Great Salt Lake due to the very wet spring of 1986; changes to the West Desert Pumping Project due to finalization of engineering design, changes to the West Desert Pumping Project due to implementation of a major modification referred to as "Bare Bones", impacts that have already occurred due to high lake levels, and protective diking that has already been constructed. In essence, Chapter 1 updates the reader to present (June, 1986) conditions.

Chapter 2 discusses impacts that would occur, or have changed substantially, due to the changes in the project or alternatives as noted in Chapter 1. Chapter 2 is a shortened version of Chapter 4, Environmental Consequences, of the draft EIS and updates the impact analysis to present conditions. Chapter 2 also contains more discussion of how the West Desert Pumping Project would be operated and how various lake rise scenarios affect its operation.

Chapter 3 is an Errata Summary that indicates text changes and additions to the EIS resulting from the comments received during the review period.

Chapter 4, Consultation and Coordination, contains background information, consultation and coordination processes, and copies of comment letters received during the 60-day review period. All comment letters have been reprinted verbatim and responses to individual comments are adjacent to the comment.

The receipt of an application from the State or Utah, Division of State Lands and Forestry, for the use of about 200,000 acres of public land administered by the Bureau of Land Management and about 150,000 acres of land controlled by the U.S. Air Force for the West Desert Pumping Project initiated the preparation of the draft and final EISs. The project includes canals, a pumping plant, dikes, and evaporation ponds and requires approval of the right-of-way request (BLM), license for controlled use request (USAF) and 404 permit request from the Corps of Engineers before federal lands can be used.

The Council of Environmental Quality (CEQ) granted the State's request for emergency authorization on May 27, 1986 allowing BLM to grant a right-of-way permit allowing construction on the West Desert Pumping Project before completion of this final EIS and the BLM Record of Decision. This authorization was made with the State's commitment to mitigate impacts of the project as identified in this final EIS.

As noted above, several changes have been made in the design of the proposed West Desert Pumping Project. These changes are discussed in this final EIS and changes to impacts are also discussed. Most impacts, however, would be the same as analysed in the draft EIS.

The Biological Opinion from the Fish and Wildlife Service is included as Appendix A.

SUMMARY

SUMMARY

ALTERNATIVES, INCLUDING THE PROPOSED ACTION

The State of Utah has filed for a right-of-way to use public and U. S. Air Force lands for what is called the West Desert Pumping Project. The major purpose of the project is to prevent flooding around the Great Salt Lake (GSL) due to rising lake levels. The project would utilize federal lands to construct a pumping plant and associated canals, and dikes to create an evaporation pond in the west desert. Water would be pumped from the GSL to the west desert pond for evaporation. The West Desert Pumping Project discussed in this final EIS is a modified version of the project as discussed in the draft EIS.

The GSL has historically experienced wide fluctuations in lake level. During 1983-84 the lake rose an unprecedented nine feet, causing an estimated $176 million in property damage and mitigation costs. The lake peaked at about 4210 in 1985. Additional rises during the spring of 1986 raised the lake to about 4212, surpassing the historic lake peak of 4211.6 and causing additional damage. Future lake rises could cause even greater amounts of damage. Some flood control measures have been implemented by the State, as well as local governments and private concerns. The Southern Pacific Railroad Causeway was breached in 1984, which lowered the south arm of the lake about one foot. Diking has been initiated in several areas to protect critical facilities. Additional lake management options have been studied by the State at a feasibility level. These studies have prompted the State to propose construction and operation of the West Desert Pumping Project as the most reasonable alternative to meet the immediate need for flood control.

A number of other flood control measures were investigated by the State, but after evaluation it was determined that they would be either ineffective in preventing flooding, would take too long to build, or would be too expensive. The only other reasonable alternative was to dike critical facilities around the lake to protect human health and safety. Therefore, a diking alternative was developed for this EIS from feasibility studies on diking contracted by the State.

In addition, a No Action alternative was analyzed as required by the National Environmental Policy Act (NEPA). In order to compare the three alternatives, the 4215 lake rise scenario was developed. The 4215 scenario was developed as a realistic, yet high, lake rise scenario. It assumed that inflow to the lake would be at about 170 percent of average from 1986 to 2000. This rate of inflow would make the GSL rise to elevation 4213 by 1989, and to 4215 by 2000, as compared to the peak 1986 level of 4212. Lake elevation would then drop to 4205 by the year 2010. A 4217 scenario was also developed as a worst case situation. In this scenario, the lake would rise at about 200 percent of normal and peak at 4217 in the year 2000, before dropping to 4205 by 2010.

Alternative 1 - No Action

The No Action Alternative assumes that permits for the West Desert Pumping Project would not be issued by the Bureau of Land Management (BLM) and the Air Force. For analysis purposes, it also assumes that no additional flood control measures would be implemented, and that unchecked flooding around the GSL would occur. Any existing flood control structures would be overtopped rather rapidly. For example, the Union Pacific Railroad grade along the south shore of the GSL would protect I-80 and other facilities until elevation 4213-4214,

when it would be overtopped.

Alternative 2 - Wes Desert Pumping Project

This is the Proposed Action and involves construction of several structures in the area west of the GSL. The project has been modified since the publication of the draft EIS and the modified version ("Bare Bones") is discussed here. Some portions of the modified project are still being designed. A pumping station would be located adjacent to, and on the south side of, the Southern Pacific Railroad grade on Hogup Ridge. Water would be pumped directly from the north arm of the lake, although canals may need to be dredged as the lake recedes. A trestle would be constructed so the water could flow under the railroad grade from north to south to the pumping station. The pumping station would utilize three pumps designed to pump up to 3500 cubic feet of water per second up about 23 feet to a discharge channel. The pumps were originally planned to be diesel powered, however present plans are for the pumps to be powered by natural gas. The discharge channel would transport the water to the north side of the railroad grade near the northern end of the Newfoundland Mountains. The water would then spread out and move south under the railroad grade and along the west side of the Newfoundland Mountains. Two dikes, the Bonneville Dike and the Newfoundland Dike would contain the pond. The Bonneville Dike would keep the pond, called the West Pond, from covering I-80 and from flooding the Bonneville Salt Flats. The Newfoundland Dike, would extend from the southern end of the Newfoundland Mountains southeasterly to high ground across the mud flats. It is called the Newfoundland Dike. A control weir in the Newfoundland Dike would maintain the maximum level of the West Pond at about 4217, and at a size of about 320,000 acres.

Water would flow over the weir in the Newfoundland Dike and then by the lay-of-the-land back to the north arm of the lake. This would result in scattered ponding in low areas between the Newfoundland Mountains and the North Arm. The water would flow under the Southern Pacific Railroad grade via a trestle to be built for the project near Lakeside. Several figures and diagrams showing the project layout can be found in Chapter 1 of this document and also in the draft EIS.

Most of the material for the dikes would come from material sites. Material for the Newfoundland Dike would come from new material sites at the southern end of the Newfoundland Mountains. Material sites for the Bonneville Dike would be located near either end of that dike and may include existing pits used by the Utah Department of Transportation. The project would cost about $55 million to build and construction would take approximately one year. The work force would not exceed about 200 persons.

Under the 4215 scenario, the West Desert Pumping Project would hold the GSL at elevation 4212 , so no additional flood control measures would be required. Under the 4217 scenario the lake would still rise to 4215 and additional flood control measures along the east shore would probably be needed.

During the design studies for the Project, costs and designs to control potential seismic (earthquake) concerns were included, as were costs to repair any local roads used to haul material to the dikes. Another proposed mitigation measure would be to have a qualified archaeologist conduct surveys in areas proposed for surface disturbance, and to conduct random surveys of the inundated areas in the west desert.

Alternative 3 - Diking to Protect Critical Facilities

This alternative involves building and/or raising dikes along the GSL to protect critical facilities, primarily sewage treatment plants, to elevation 4215 or 4217, depending on the lake rise scenario. This alternative assumes that seven dikes would be built to protect these facilities. The Union Pacific Railroad grade along the south shore of

the GSL would protect I-80 and other facilities until elevation 4213-4214, so it is considered as another existing dike. Therefore, the eight dikes being considered in this EIS include the Corinne Waste Water Treatment Plant (WWTP) Dike, Perry WWTP Dike, Plain City WWTP Dike, Little Mountain WWTP Dike, South Davis Dike, Rose Park Dike, South Shore Dike and UPRR/I-80 Dike. The South Davis Dike protects sewage treatment plants and refuse disposal sites west of Bountiful. The Rose Park Dike protects areas around the mouth of the Jordan River near the Rose Park residential area. The South Shore Dike protects I-80 near the Saltair resort. Material for construction of these dikes would come from Wasatch Front sources. The Union Pacific railroad grade along the south shore of the GSL would protect I-80 and other facilities until elevation 4213-4214 after which it would be abandoned and the freeway and railroad would be rerouted to higher ground. Dikes built by AMAX Magnesium and American Salt Company also protect portions of the Union Pacific grade, I-80 and Timpie Waterfowl Management Area north and west of Grantsville. This alternative would protect the areas immediately behind the dikes, but no other areas.

ENVIRONMENTAL CONSEQUENCES

Alternative 1 - No Action

This alternative would allow the GSL to rise unchecked. Numerous areas along the east shore would be flooded, affecting farmlands, wetlands, wildlife habitat, recreation, economic and cultural resources. I-80 along the south shore of the GSL would be inundated, as would the Union Pacific Railroad grade and the Southern Pacific Railroad Causeway, creating major transportation problems. All the remaining evaporative industries around the lake would be flooded, as well as much of the Rose Park residential area and several waste water treatment plants and refuse sites. Costs of the damages could exceed $1 billion

In addition, fog and low clouds would increase as the lake became larger, affecting weather along the Wasatch Front and in the west desert but only during the winter months. This poor weather would also reduce the amount of time the Air Force could use the Utah Test and Training Range (UTTR).

It is likely that some flood control measures would be undertaken, but for analysis purposes, none were included in this alternative.

Alternative 2 - West Desert Pumping Project

Impacts of this alternative to the west desert would be fairly minor since most of the area impacted is mud flat. Kaiser Chemical may be benefited by increased brine flow caused by groundwater recharge from the West Pond. Grazing access to the Newfoundland Mountains and southern Hogup Ridge would be restricted by the discharge channel.

Under the 4215 scenario, the lake would essentially not rise from present levels, creating significant flood control benefits to shoreline areas. All sectors would be benefited, especially the transportation sector. Under the 4217 scenario, most of the No Action flooding impacts would still occur and few benefits would occur.

The major negative impact of the Project would be an increase in winter fog around the GSL, and an increase in precipitation along the Wasatch Front. This would impact the Air Force operations on the UTTR, but for only a few days. Also, both the West Pond and scattered ponding in the East Pond area resulting from flow back to the lake would restrict flight operations because Air Force regulations do not allow low level flights over open water, and they would endanger pilots that eject from their aircraft in this area.

Alternative 3 - Diking to Protect Critical Facilities

This alternative would have some negative impacts, but like the Proposed Action, primarily provides flood control benefits. However, benefits of diking

would be considerably less than West Desert Pumping under the 4215 scenario. Major flood damage to mineral industries, transportation corridors and farmland would still occur under this alternative. The major negative impact would be the loss of deer winter range due to borrow material removal from sites along the Wasatch Front. Under the 4217 scenario, even more extensive flooding impacts would still occur.

CHAPTER 1

CHANGES THAT HAVE OCCURRED SINCE THE DRAFT EIS

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CHANGES THAT HAVE OCCURRED SINCE THE DRAFT EIS

CHANGES IN THE LEVEL OF THE GREAT SALT LAKE

Since the release of the draft EIS, several important changes have occurred. The spring of 1986 saw a large amount of precipitation that caused the Great Salt Lake (GSL) to rise rapidly. The lake rose from an elevation of about 4208.3 in October, 1985, to a new historic peak elevation of 4211.85 in June, 1986. The previous historic record level was 4211.6, set in June, 1873. During April, 1986 the lake rose almost 10 inches, which was two inches more rise than occurred in April 1984, the previous record April rise.

The rise as noted above is greater than projected by either the 4215 or 4217 scenarios used in the draft EIS for analysis purposes. These scenarios have been updated to reflect a lake level of about 4212 in 1986 and are discussed in more detail in Chapter 2.

The Utah Division of Water Resources recently completed aerial mapping of the west desert area and produced a map with one foot contour intervals. This map (Figure 1) allows for a better interpretation of West and East Pond elevations and sizes, as well as natural avenues of water flow. The study indicates that the threshold into the area west of the Newfoundland Mountains is just a few inches above 4215. A level of 4215 was used in the draft EIS.

CHANGES IN THE WEST DESERT PUMPING PROJECT DUE TO FINAL DESIGN

As noted in the draft EIS, final design of the West Desert Pumping Project was ongoing during the EIS analysis. Therefore, several project features described in the draft EIS were altered when the final design was completed (West Desert Group 1986a). Major changes include the following:

West Pond - The normal operating level of the West Pond was changed from 4218 to 4217, or from a surface area of about 375,000 acres to 320,000 acres.

Bonneville Dike - The Bonneville Dike was originally to be built from native lakebed materials. Due to poor material conditions, much of the dike will probably have to be built of granular material transported from nearby material sites. Proposed material sites are shown in Figure 2. The actual sites to be used, or the size of each site, would be developed as part of the construction management contracts for the project. Site-specific environmental documentation of impacts would be required when the sites to be used are known.

East Pond - The normal operating level of the East Pond was changed from 4214 to 4213, with a corresponding change from 114,000 acres to about 75,000 acres.

Pumping Rate - A variable rate pumping scheme was developed that would pump 2800 cfs during the seven summer months and 933 cfs during the five winter months. This variable rate was developed to save operational costs and still maintain high summer evaporation.

Project Cost - Project costs increased from $75 million to $90 million.

CHANGES IN THE WEST DESERT PUMPING PROJECT DUE TO MODIFIED DESIGN

In addition to the completion of the final design, other modifications were also made in the project. Due to the rapidly rising lake level, considerable attention was focused on the pumping project and other alternatives to control the GSL flooding. Interest in the West Desert Pumping Project increased dramatically in Utah with almost daily features in local newspapers. Local, county and state officials became heavily involved in the discussion of what flood control

measure to use. The very high cost of the West Desert Pumping Project was a major concern, and the design consultants were asked by the State whether a feasible pumping project could be built for less. This resulted in a design modification that provided for pumping to the west desert at a cost of $55 million (West Desert Group 1986b) rather than $90 million. Funding for this modification, referred to as "Bare Bones" or "Phase I", was authorized by a special session of the Utah Legislature in May, 1986, and became the State's Proposed Action. The State then requested emergency authorization from the Council on Environmental Quality to start construction before this final EIS was completed and that request was granted on May 27, 1986.

The following discussion indicates the changes in design that would occur with the Modified West Desert Pumping Project. Most features of the project would remain unchanged. Figures 2 and 3 show the features of the new design. All of these changes were made to reduce costs yet maintain a viable flood control project.

Intake System - The original design included a new breach in the Southern Pacific causeway, an isolation dike in the north arm, and a canal to the pump station formed by an East Pond barrier dike. These features were all designed to assure that relatively fresh south arm brine reached the pump station. The modified design would alleviate all of these intake features, although they could be built at a later date. Water for the pumping plant would be taken directly from the western portion of the north arm adjacent to Hogup Ridge (Figures 2 and 3). The pumping plant would cause the water to flow from the north arm under a trestle to be built in the Southern Pacific grade to the pumping plant. Since the use of heavier north arm brine would create potential problems with evaporation rate and salt precipitation in the West Pond, the State's design consultant is investigating the feasibility of dredging a canal from the existing causeway breach to the pumping plant and using a floating boom to divert the fresher south arm brine toward the pumps.

Pumping Plant - The pumping plant would be built in the same location as noted in the draft EIS. A small dike would separate the plant from the water in the East Pond area. A decision was made in June, 1986 to use natural gas to power the pumps since the Southern Pacific grade had been washed out, making the future availability of diesel fuel questionable. This change in power source would not effect pumping capacity but could reduce operational costs. The proposed natural gas pipeline route and any other related changes in proposed use of federal land will be analyzed in an additional site-specific environmental documentation.

Discharge Channel - The discharge channel would remain the same as discussed in the draft EIS.

Railroad Dikes - The original design called for dikes to protect the Southern Pacific Railroad grade in the West Pond. The modified plan would eliminate these dikes and instead raise the level of the grade and increase riprap for wave protection.

West Pond - The West Pond elevation would remain at 4217.

Bonneville Dike - The Bonneville Dike would be reduced in height by 3 feet to elevation 4223, thereby increasing the chance of overtopping by waves. Increased amounts of riprap would be used to prevent erosion of the dike.

East Pond - The East Pond would be eliminated under the modified design; however, scattered ponding could result in low areas between the Newfoundland Weir and the north arm. Water would flow directly back to the north arm through the Southern Pacific grade via a trestle near Lakeside (Figures 2 and 3), which was planned as part of the original intake design. The elevation of the water in the East Pond area would be at about the elevation of the north arm.

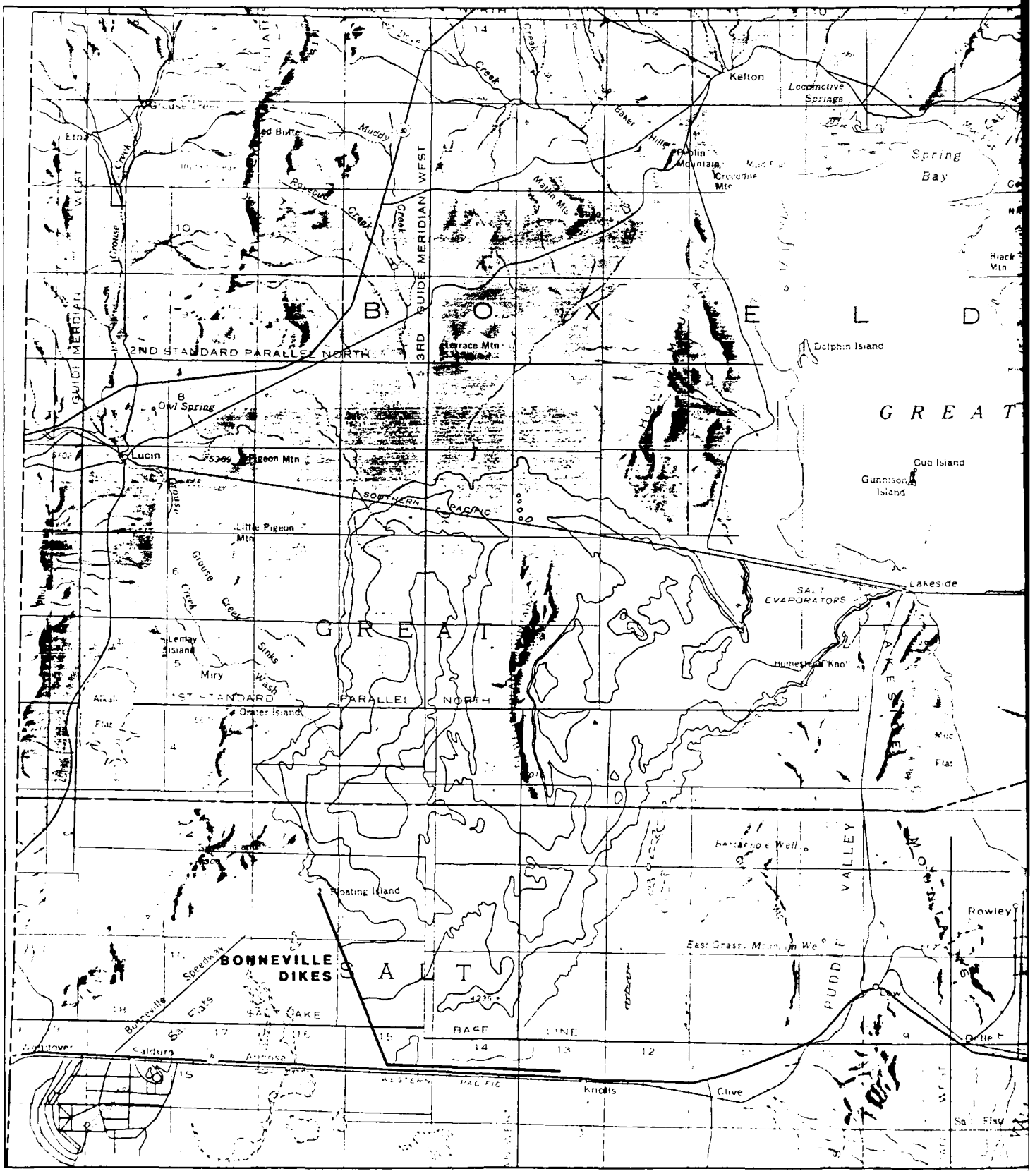

Figure 1. Contour Map of the West Desert Area.

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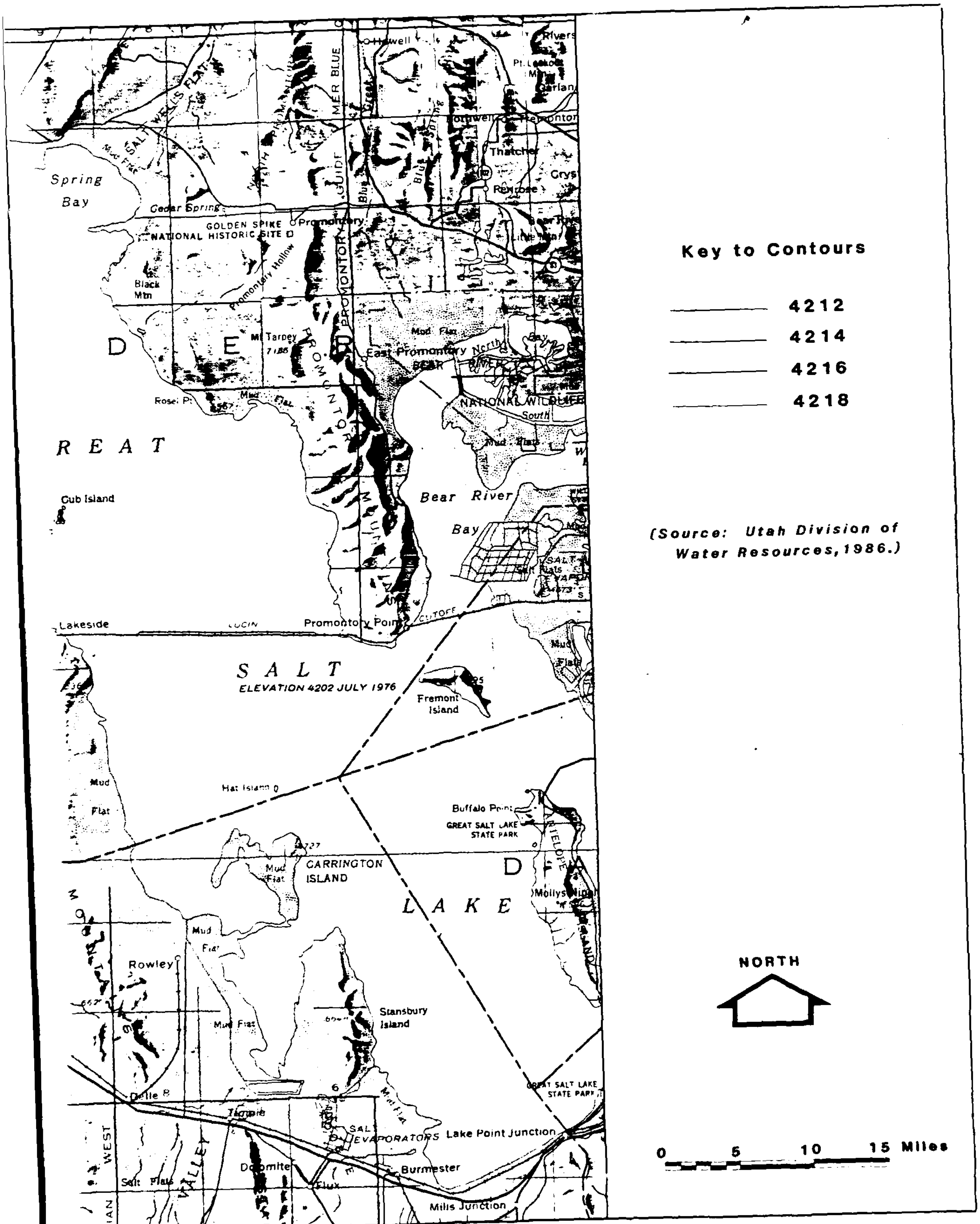
Key to Contours
4212
4214
4216
4218
(Source: Utah Division of Water Resources, 1986.)
NORTH
0 5 10 15 Miles
Spring Bay
GOLDEN SPIKE NATIONAL HISTORIC SITE
Promontory
Black Mtn
Promontory Hollow
Mt Tarpey
Rosel Pt
R E A T
Cub Island
Thatcher
Penrose
East Promontory
Mud Flat
Bear River Bay
NATIONAL WILDLIFE
Lakeside
Promontory Point
S A L T
ELEVATION 4202 JULY 1976
Fremont Island
Hat Island
Buffalo Point
GREAT SALT LAKE STATE PARK
CARRINGTON ISLAND
L A K E
Rowley
Stansbury Island
Lake Point Junction
Burmester
Mills Junction
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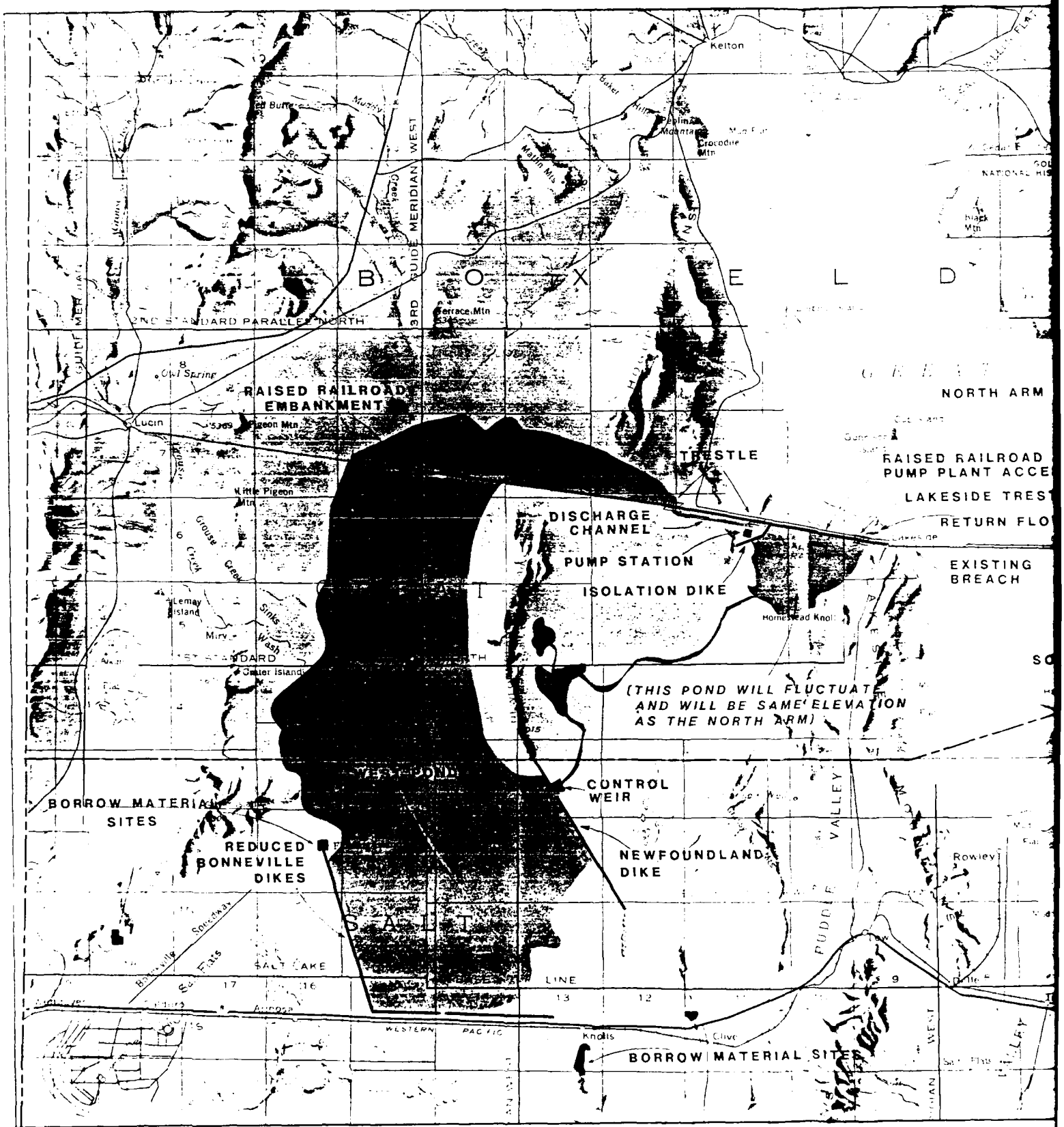
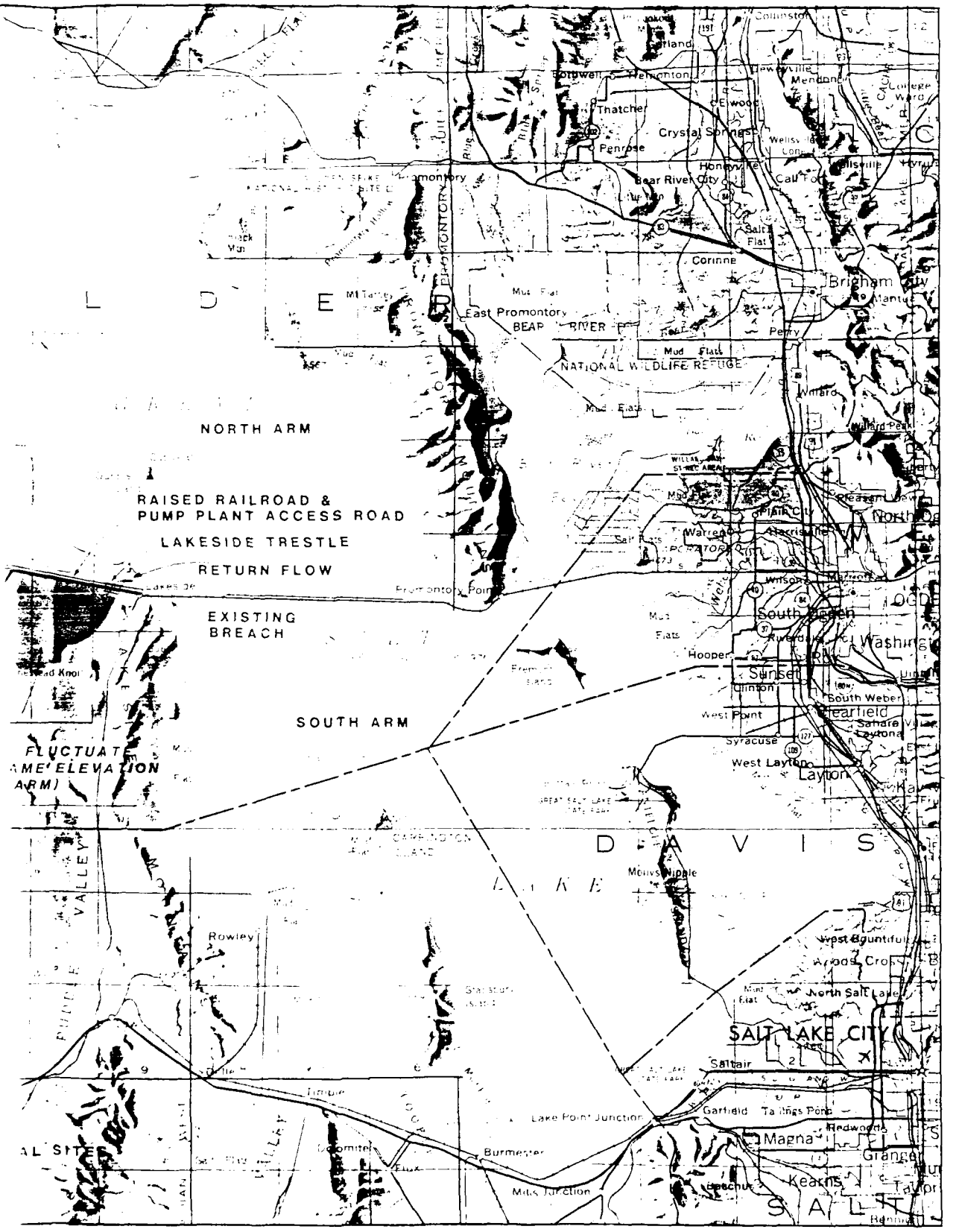


Figure 2. Components of the Modified West Desert Pum



he Modified West Desert Pumping Project.

29.8

Figure 3. Artist's Rendering of Components for Modified West Desert Pumping Project.

The Southern Pacific Railroad grade between Lakeside and Hogup Ridge would be raised and the access road beside it enlarged to permit use by construction traffic to gain access to the pumping station and discharge canal.

Return Siphon - The return siphon would also be eliminated under the modified design. A trestle for the railroad grade that had been planned for the return siphon would still be built and would serve as the intake route for the north arm brines to reach the pumping station.

System Operation - The general operational scheme would be the same for the modified design as was discussed for the original design. Water would still be pumped out of the GSL and into the west desert, and it would then flow back into the north arm. However, under the modified design, the brine would be considerably more saline since it would be coming from the north arm rather than the south arm. The increased brine concentration would therefore increase the likelihood of salt precipitation in the West Pond since less evaporation would be needed to reach saturation and subsequent precipitation. To prevent salt precipitation in the West Pond, more water, up to 3500 cfs, would need to be pumped to reduce the travel time in the pond. This would require either using more or larger pumps, or running the designed pumps at a higher rate. The State's design consultant is investigating these problems, as well as ways to get south arm brine to the pumps from the existing causeway breach as noted above. Yearly operational costs would undoubtedly rise from the $3.5 million used in the draft EIS.

The modified design could be operated until the lake reached about 4216 feet, when it would drain directly into the west desert over the Newfoundland Weir, as in the original design. The modified design could only take the lake down to 4208, rather than 4205 as in the original design, unless the inlet area was dredged to allow north arm water to flow to the pump station at lower levels. Overall evaporation would be reduced to 800,000 to 900,000 acre feet per year rather than the 1.1 million acre feet for the original design due to the loss of the East Pond and subsequent loss of evaporative surface area.

Construction Scheduling - Construction scheduling would be similar to that discussed in the draft EIS as far as the progression of the work, but the overall timing would be altered considerably since pumps were not ordered until late May, 1986. Also, recent proposals have decreased the time needed to have the pumps operational, and pumping may start as early as February, 1987.

In summary, the overall concept of the West Desert Pumping Project remains intact with the modified design. Construction costs have been reduced; but at the expense of lower overall evaporation and increased chance of salt precipitation in the West Pond, increased chance of damage to I-80 in the west desert, and increased operation costs due to larger pumping requirements. These latter factors have reduced the effectiveness of the project. Using a figure of 820,000 acre feet of evaporation per year for the modified design, Figure 4 shows the effectiveness of the modified design in comparison with the original West Pond and Bonneville Pond for the updated 4215 scenario. The modified design would initially take the lake level down, but it would then slowly rise back up to 4212. A similar comparison for the 4217 scenario would have the GSL rising to 4215 or slightly beyond (Figure 5) in the year 2000 with the modified design. Therefore, the reduction in cost and subsequent reduction in evaporation reduces the effectiveness of the project, especially under conditions such as the 4217 scenario.

CHANGES IN THE DIKING ALTERNATIVE

The alternative to West Desert Pumping analyzed in the draft EIS was the Diking of Critical Facilities. This alternative has not changed except that more of the diking has been initiated and existing dikes have been raised. There-

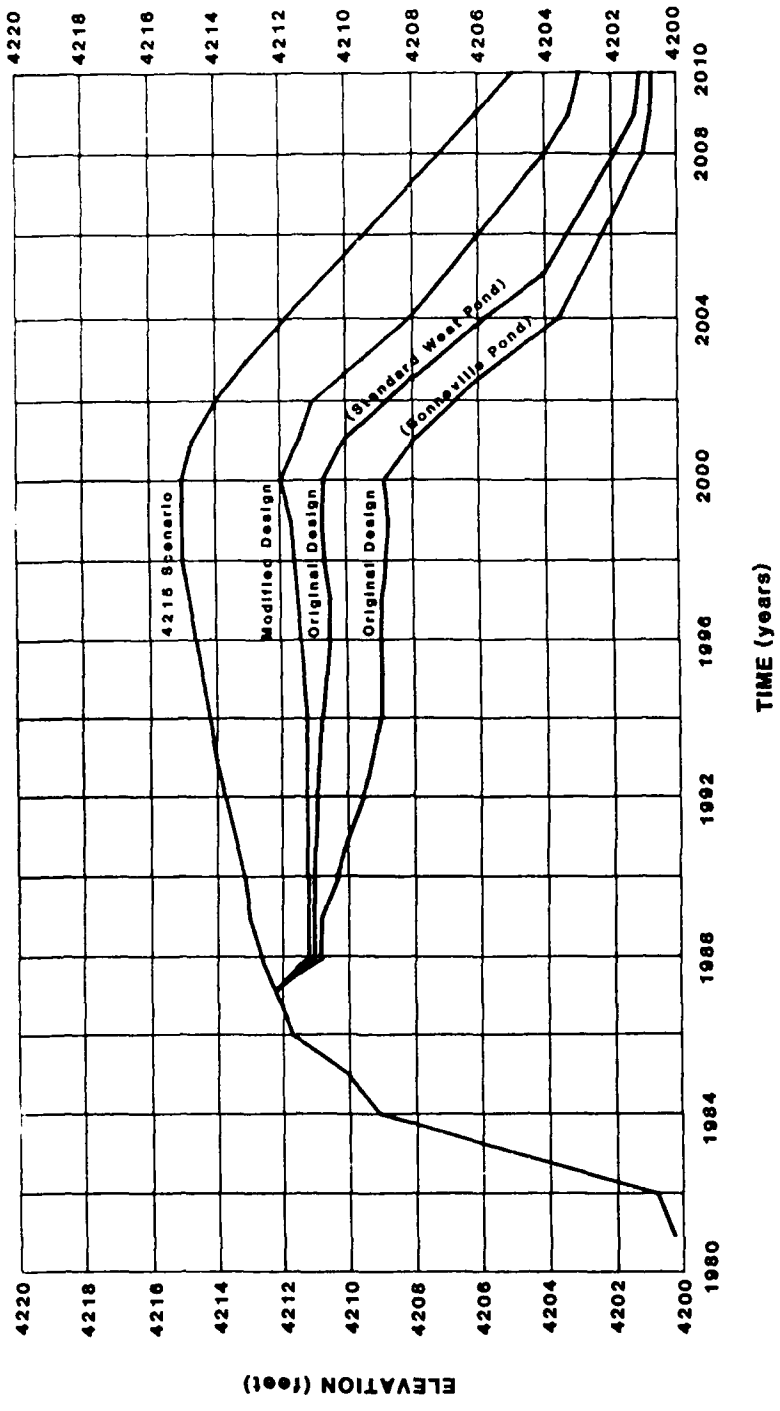


Figure 4. Great Salt Lake 4215 Scenario and West Desert Pumping Options.

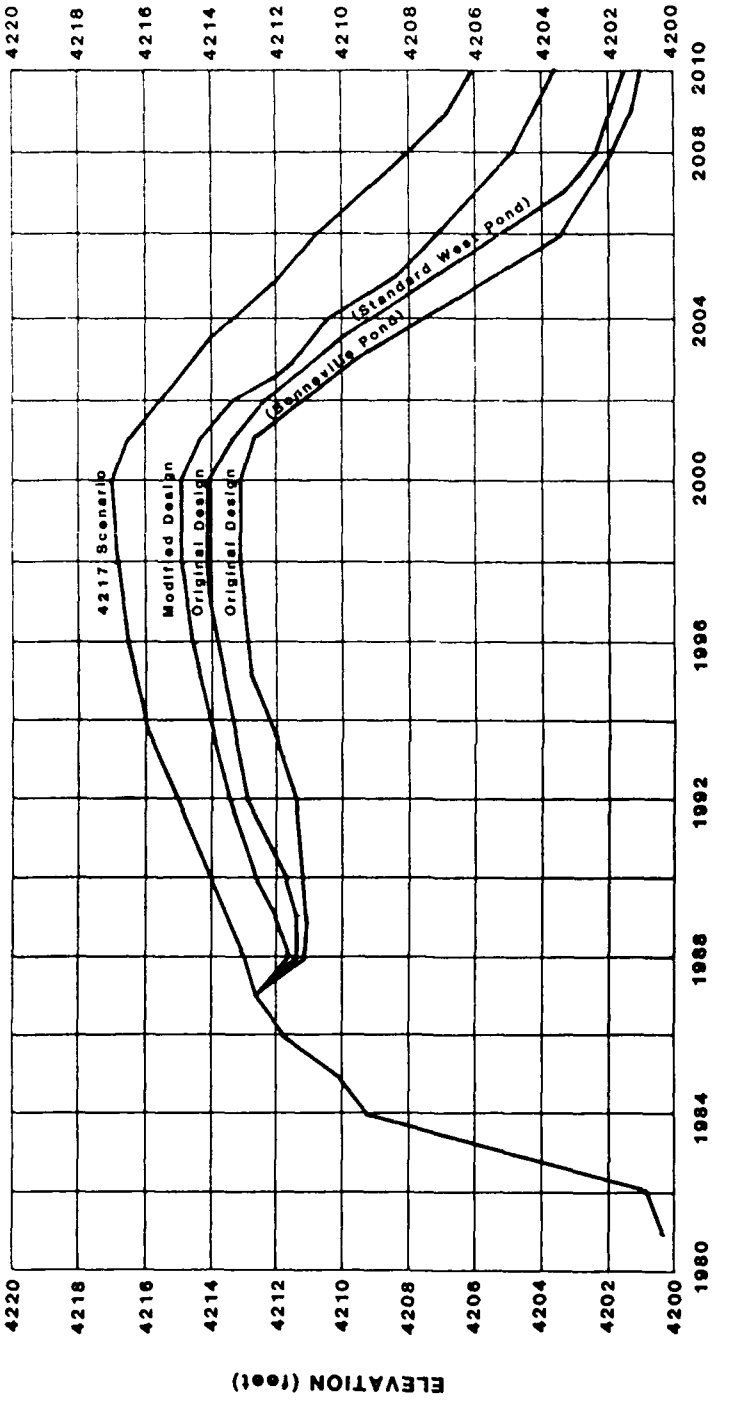


Figure 6. Great Salt Lake 4217 Scenario and West Desert Pumping Options.

fore, costs of diking further have been reduced since some of the dikes noted in the draft EIS have already been built. The State Legislature also appropriated $10 million to the Community Impact Board for additional emergency diking in the May, 1986 Special Session.

CHANGES IN FLOOD DAMAGE

Damages due to the No Action Alternative discussed in the draft EIS have partially occurred, at least those damages that would occur up to 4212. In addition, high wave damage and flooding has occurred to some facilities that were thought to be protected up to 4213 or higher. For example, I-80 along the south shore of the GSL was damaged by waves due to a strong south wind, and repairs have had to be made. Union Pacific Railroad, with financial assistance from the State, has raised their grade along the south shore of the GSL by 2.5 feet and has had to repair wave damaged areas. The Southern Pacific causeway is presently shut down since late April due to waves splashing over, and piling debris on the track in several locations. Dikes protecting AMAX Magnesium's evaporation ponds broke during a major wind storm in early June and most of their ponds were flooded. The same storm closed the Southern Pacific grade between Lakeside and Hogup Ridge for major repairs.

Numerous reports of flooded basements and minor flood damage to residences and industry in the Rose Park area and other east shore areas has occurred as predicted in the draft EIS. Additional farmlands have also been flooded or damaged by groundwater. Therefore, some of the impacts noted under No Action in the draft EIS have already occurred, so benefits of any flood control plan would be reduced somewhat from those discussed in that document.

CHAPTER 2

IMPACTS DUE TO CHANGES

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IMPACTS DUE TO CHANGES

INTRODUCTION

This chapter discusses impacts that would occur due to the changes in lake elevation, design, or existing flood damage discussed in Chapter 2 that were not discussed in the draft EIS or have changed from those discussed in the draft. The basis of the analysis is the 4215 scenario, with the 4217 scenario also being discussed. Figure 4 shows the 4215 scenario and Figure 5 shows the 4217 scenario. Both scenarios have been updated to start at a lake elevation of about 4212 in 1986. Therefore, the 4215 scenario used in this final EIS assumes the lake would rise three additional feet in 14 years to peak at 4215 in the year 2000. This same scenario in the draft EIS assumed a rise of four feet in 14 years, since it assumed the 1986 elevation would only be 4211. Therefore, the total rise is one foot less for the 4215 scenario in this final EIS, which means the total inflow to the GSL must be lower than the 185 percent of normal used in the draft EIS. An inflow of about 170 percent of normal would produce the 4215 scenario used in this final EIS.

Likewise, the 4217 scenario is slightly altered by starting at 4212 rather than 4211. Similar to the 4215 scenario discussed above, the higher initial lake elevation reduces the amount of inflow needed to reach 4217 by the year 2000 from 225 percent to about 200 percent of normal.

Therefore, the peaks of the lake rise scenarios used for comparison purposes in this EIS are the same in both the draft and final EISs, but the rate of increase is slightly different. This makes very little difference in the impacts or benefits of the three alternatives since lake elevation was the main factor used to assess impacts. As noted in the draft EIS, the lake rise scenarios used were not meant to be projections of how the GSL would actually rise, but were convenient vehicles for comparison of flood control alternatives. In all likelihood, the lake would not rise at a constant rate for 14 years but rather would rise at different rates each year. Some years would be over 200 percent of normal, such as 1986, while other years would be closer to normal. The actual rate of rise would have little effect except in the west desert where No Action impacts would vary from year to year rather than being fairly constant. Large amounts of ponded water in the west desert would only occur during high runoff years, and then only during spring and early summer unless summer precipitation was also much higher than normal. These situations are discussed in the following sections where appropriate.

NO ACTION

Impacts under the 4215 and 4217 scenarios would be very similar to those discussed in the draft EIS for most disciplines. Slightly more water would probably flow into the west desert at the peak of the 4215 scenario than discussed in the draft EIS based on the new contour map (Figure 1), but not substantially more. No additional impacts would occur due to this extra water. As noted earlier in this document, a number of impacts predicted in the draft EIS have already occurred. These impacts are summarized below by discipline.

Mineral Resources - Brine concentration in the GSL has continued to be reduced, affecting the evaporative industries. Diking around evaporation ponds and other facilities has continued, but AMAX Magnesium's main dike to Stansbury Island was ruptured in a major wind storm and most of their evaporation ponds were flooded.

Soils - Over 1000 acres of additional prime or important farmland soils have been inundated by the rising lake and

additional acres have been affected by rising groundwater.

Climate - Long periods of fog continued to affect northern Utah in the winter of 1985-86, primarily during December and early January. This poor weather reduced the use of the Utah Test and Training Range (UTTR) by the Air Force.

Surface Water - The portion of the west desert flooded by the north arm of the GSL continued to expand in the area between the Lakeside and Newfoundland Mountains. Standing water occurred throughout much of the west desert in the spring of 1986.

Vegetation - Increased amounts of cropland were affected by the rising waters, as noted under Soils. Remaining wetland areas were also lost, primarily along the east shore of the lake and at Locomotive Springs, as predicted by Table 4.6 of the draft EIS.

Aquatic Biology - The aquatic community of the lake continued to move towards more freshwater species and lower numbers of "brine species".

Wildlife - Wildlife using wetlands were further affected by the continued loss of wetland habitat along the east shore of the lake.

Utah Test and Training Range - The North Range of the UTTR was affected by the increased amounts of standing and ponded water in the west desert during the spring of 1986 and fog and low clouds during December and January of the 1985-86 winter. Numbers of Air Force missions using the range were reduced from historical use patterns.

Recreation - Problems at the Saltair Marina continued, especially from the impact of waves during windy periods. Many boats were removed from the marina.

Cultural Resources - Additional archaeological sites were inundated by the rising lake.

Social Conditions - Additional social impacts due to residential flooding and the uncertainty of the lake rise continued to effect some east shore residents.

Economics - Additional flooding of industrial and residential areas along the east shore occurred and diking was initiated or continued to protect these areas. I-80 and both the Union Pacific and Southern Pacific grades were impacted by wave damage but all still remained operable. Local public utilities continued to dike or move facilities in response to the rising lake. Groundwater pumping at the Salt Lake City International Airport continued on a constant basis. Loss of many remaining wetlands may well affect waterfowl hunting in the fall of 1986. Additional losses to farmland occurred with resultant loss of income and capital damages.

In addition to the damages that occurred due to the rising lake as noted above, the draft EIS predicted that the west desert would have large amounts of standing water in it for much of each year. This did occur in the spring and early summer of 1986. Major impacts of this ponding were predicted by the draft EIS to occur to the use of the Bonneville Salt Flats and to the use of the UTTR. Depending on the type of spring northern Utah has, much of this water may evaporate by early summer and allow use of the Bonneville Salt Flats for racing and other recreation. Use of the Salt Flats generally only occurs in late summer and fall, therefore no real restrictions may occur. Likewise, the use of the UTTR may not be that much affected by standing water. Figure 1, the new contour map of the west desert, indicates that two major ponded areas would occur just east of the Newfoundland Mountains. These ponded areas may contain water all summer and therefore affect low level flights over this area, or they may dry up. Therefore, No Action impacts to the use of the Bonneville Salt Flats and the UTTR may not be as serious in 1986, or in future years, as described in the draft

EIS. The major reason for this is that in 1986 the high amounts of precipitation and inflow to the lake occurred early in the year rather than extending through the summer period as was the case in 1983. Therefore, No Action impacts to the Salt Flats and the UTTR may be overestimated in the draft EIS using either of the lake rise scenarios.

No Action impacts of GSL levels greater than 4212 would be the same as discussed in Chapter 4 of the draft EIS, with the possible exceptions of the Bonneville Salt Flats and UTTR as noted above.

WEST DESERT PUMPING PROJECT

As noted in Figures 4 and 5, the modified West Desert Pumping Project would keep the GSL from rising above 4212 under the 4215 scenario, but would allow a rise to about 4215 under the 4217 scenario. Therefore, under the 4215 scenario no additional flooding impacts would occur over those that have already occurred. This was the same situation discussed in the draft EIS, except not as much damage had occurred. Under the 4217 scenario, the project would allow the lake to continue to rise, although at a slower rate, to a peak of about 4215, a foot higher than analysed in the draft EIS. Therefore, additional impacts due to lake flooding would occur to most disciplines. This is very similar to the situation discussed in the draft EIS, but of slightly greater magnitude.

In addition, if the GSL south arm rises to 4215, the north arm would be at or very close to the upper design limit of the pumping plant (4215). This would require some type of action to preserve the system, and this EIS assumes that appropriate action would be taken. Also, water from the north arm would flood over to the Newfoundland Dike, flooding essentially all of the East Pond area. The pumping plan would be very close to being inoperable at this point. However, the 4217 scenario has the lake receding before natural conditions cause this to happen.

Therefore, the discussion of impacts in the draft EIS generally holds for the new scenarios, except that 4217 impacts would be even greater. The following discussion primarily addresses changes in impacts due to the modified design of the project since benefits are very similar to those discussed in the draft EIS.

Mineral Resources - Under the 4215 scenario, the modified design of the West Desert Pumping Project would still protect the remaining evaporative industries around the GSL from rising water levels, and brine concentrations would be slightly increased due to lower lake levels. Under the 4217 scenario, mineral industries would be flooded, similar to the draft EIS situation.

Soils - The modified West Desert Pumping Project would prevent an additional 5427 acres of important soils from being flooded or damaged by groundwater under the 4215 scenario, but only about 3500 acres would be protected under the 4217 scenario.

Climate - Under the 4215 scenario, winter weather in northern Utah would still be adversely affected by the West Pond (Hill 1985), although the decreased size of the pond would reduce the effect slightly. According to the Air Force weather study (AFLC 1985) which does not entirely agree with the Hill (1985) weather study, the number of restrictive days on the UTTR would be reduced substantially due to the elimination of the East Pond and would probably be no greater than five days more than the No Action situation. Under the 4217 scenario, weather impacts would be more similar to the No Action situation in both northern Utah and the UTTR, as discussed in the draft EIS. Both the Hill (1985) and the Air Force (1985) weather studies are available upon request from the BLM, Salt Lake District Office.

Groundwater - Groundwater impacts to the Bonneville Salt Flats would be reduced from those discussed in the draft EIS for both scenarios due to a lower mean operating level of the West Pond (4217 versus 4218). Except during periods of

strong north winds, very little water would lay against the Bonneville Dike since the lowest ground elevation along its route would be about 4216 (Figure 1). Therefore, little groundwater would seep out of the West Pond due to cracks in the clays under the dike, and the Salt Flats would be as usable as under the No Action alternative, so no significant impact would occur.

Vegetation - Significant amounts of wetland and cropland would be protected from flooding under the 4215 scenario, although not as much as discussed in the draft EIS. About 13,015 acres of wetland and 1,681 acres of cropland would be protected from flooding. An additional 3746 acres of cropland would be spared groundwater problems, the same amount noted in the draft EIS. Benefits to these important vegetation types under the 4217 scenario include 4160 acres of wetland and about 3500 acres of cropland.

Wildlife - Prevention of loss of significant wetland acreage would benefit wildlife under the 4215 scenario as noted in the draft EIS. Benefits would be reduced considerably with the 4217 scenario as noted for vegetation above, but would be similar to those discussed in the draft EIS for this scenario. Impacts to wildlife, primarily raptors, may occur due to material sites needed for the Bonneville Dike. Site-specific impacts will be determined in a separate environmental documentation when the actual sites and mining plans are known.

Grazing -Impacts to grazing in the Newfoundland and Basin L&L allotments would be similar to those discussed in the draft EIS under both scenarios. The bridge mentioned in the draft EIS that would be built for the discharge canal would not be acceptable as a livestock crossing since it would be too far out in the mud flats. Therefore, an additional bridge for livestock, or other mitigation, would be required to alleviate this impact.

Utah Test and Training Range - Impacts would generally remain very similar to those discussed in the draft EIS, with restrictive winter weather and flight restrictions over open water and pilot safety following ejection the major impacts. Flight restrictions due to restrictive weather caused by the East Pond would be nearly eliminated since return flow from the Newfoundland Weir would create smaller areas of ponding where the East Pond had been planned. This would reduce the number of restrictive days with poor weather to about 5 days per winter beyond No Action levels, since considerable ponding would also occur most years during the winter under No Action also. Restrictions to low level flight due to the West Pond would probably be slightly greater than noted in the draft EIS because west desert ponding under No Action may be less frequent than predicted in that document. Pilot safety following ejection would also be worse than discussed in the draft EIS since the West Pond would be more permanent than No Action ponding. Both low level flight restrictions and pilot safety would also be impacted in the East Pond area. Return flows would maintain ponding in low areas between the Newfoundland Mountains and Lakeside Mountains during the summer when they would have evaporated under No Action. Therefore, flight operations and pilot safety would be more affected by the West Desert Pumping Project than discussed in the draft EIS in the East Pond area, as well as the West Pond area, under the 4215 scenario. Under the 4217 scenario, impacts would remain as discussed in the draft because most of the impacts of West Desert Pumping would also occur under No Action since most of the area would be flooded naturally.

Impacts to flight operations and pilot safety in the East Pond area could be mitigated by construction of a canal to drain ponded water in that area, rather than allowing it to flow naturally back to the north arm. Mitigation would need to be accomplished satisfactory to the Air Force as part of any license issued to use the Air Force lands for the project.

Recreation - Impacts to the Bonneville

Salt Flats would not occur as discussed in the draft EIS due to the lower level of the West Pond.

Visual Resources - Visual impacts due to the material sites needed for the Bonneville Dike could be significant. Site- specific analyses will be presented in a separate environmental document when the exact sites and mining plans are known.

Cultural Resources - Impacts and mitigation would be the same as noted in the draft EIS.

Social Conditions - No changes would occur over those discussed in the draft EIS except the dissatisfaction over loss of the Bonneville Salt Flats would be eliminated since this area would not be impacted by the project.

Economics - The economic benefits of the construction of the project would be less than noted in the draft EIS due to the lower cost. Losses of revenues due to impacts on the Bonneville Salt Flats would not occur with the lower West Pond elevation. Economic benefits to the east shore would be very similar to those discussed in the draft EIS for both scenarios. Very little additional flood damage would occur under the 4215 scenario. Most of the major impacts to transportation, industry and residential areas would still occur under the 4217 scenario.

DIKING TO PROTECT CRITICAL FACILITIES

This alternative would change very little from the analysis presented in the draft EIS. Several of the dikes have been built or were increased in height to provide protection from the rising lake. Impacts would be very similar to those discussed in the draft. Only those areas directly behind the dikes would be protected and major losses to transportation, industry and residential areas would occur under both scenarios.

MITIGATION SUMMARY

This section summarizes the mitigation required by the EIS process that will enable the State of Utah to be in conformance with the CEQ emergency authorization to begin construction on the project before completion of the final EIS.

UTTR - Heavy duty screens should be installed across the opening of the control weir and under the railroad trestle near Lakeside to catch and detonate any incoming ordnance. To prevent inadvertant detonation of ordance, an area approximately 200 feet in width encompassing the eight mile length of the Newfoundland Dike should be cleared by the airforce to a depth of about 15 feet during the dry summer months before construction, at a cost of about $440,000. Impacts of flight restrictions due to the West Pond would be difficult to mitigate. The Air Force may need to evaluate changes in flight restrictions or altered flight paths to avoid the West Pond. A canal could be constructed to drain low lying areas in the East Pond area that will fill with water draining from the West Pond. This will mitigate impacts to low level flights and pilot safety associated with ejections over this area. The State will need to coordinate closely with the Air Force, and Tooele and Box Elder counties on roads used for construction traffic. Any deterioration of present road quality due to construction traffic should be repaired by the State.

Grazing - Livestock access across the discharge channel to the southern part of Hogup Ridge and the Newfoundland Mountains would require some form of mitigation, such as a bridge.

Material Sites and Gas Line - Potential mitigation may be identified in subsequent environmental documentation for proposed material sites for the Bonneville and Newfoundland dikes or the natural gas corridor.

CHAPTER 3

ERRATA SUMMARY

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ERRATA SUMMARY

The following revisions have been made based on comments received during the review period for the draft EIS. Changes are listed by page number and identified by paragraph and line. Major revisions due to changes in the design of the West Desert Pumping Project or other conditions that have been altered since publication of the draft EIS were discussed in the preceding chapters and are not repeated here.

Page	Col.	Para.	Line	IS	SHOULD BE
21	R	4	1	N/A	Add: The pumping plant would operate between lake levels of 4205 and 4216. It would be shut off when the lake reached 4216 and flowed to the west desert.
22	L	3	10	...breach to the intake channel.	...breach and under a bridge to the intake channel.
29	R	4	10	N/A	Add: If the lake rose above 4212, the East Pond would have to be pumped.
38	R	3	8	...Willard Bay...	...Willard Bay Reservoir..
63	Table 2.1			N/A	Add: These costs include amounts needed to construct the dikes from ground level to 4515 except where dikes are already built.
68	Table 2.3	Wildlife, West Desert			
				years then No Action.	years than No Action.
75	R	2	3	The minerals include salt mirabilite, magnesium, lithium, bromine, and potassium.	The minerals include salt, mirabilite, and other compounds of magnesium, sodium, lithium, bromine, and potassium.

CHAPTER 3 - ERRATA SUMMARY

Page	Col.	Para.	Line	IS	SHOULD BE
79	R	1	8	N/A	Add: Continued interest in future drilling in the lakebed has been expressed by other lessees.
79	L	4	1	The west desert floor has not developed a soil and does not support vegetation.	The west desert floor has only scattered areas with a developed soil. Most of the area has not developed a soil and does not support vegetation.
81	Figure 3.3			Add in a 50 acre tract of important farmland along the northern tip of Willard Bay Reservoir.	
87	L	6	7	N/A	Add: About 3 acres of wetland occurs along the eastern flank of the Hogup Ridge near the Southern Pacific Railroad grade.
93	Figure 3.5			Change name of Air Force lands from Hill Air Force Bombing and Gunnery Range to Utah Test and Training Range, North Range.	
99	R	4	10	...a privately owned facility...	...a privately managed facility...
99	R	4	16	N/A	The use of the marina increased in 1985 in part due to the protection afforded by the pilings and breakwater.
103	R	1	14	...Flats (Class III)	...Flats (Class II)
108	L	1	1	...in 1983.	...in 1983, but reopened in 1984.
109	R	5	1	8. General...	7. General...
110	L	2	1	9. Waterfowl...	8. Waterfowl...
110	R	2	1	10. Agricultural...	9. Agricultural...
117	R	3	1	Since no developed soils..	Since only limited areas of developed soils...
117	R	4	5	...3056 acres...	...3091 acres...

CHAPTER 3 - ERRATA SUMMARY

Page	Col.	Para.	Line	IS	SHOULD BE
118	L	1	1	...3746 acres...	...3761 acres...
118	Table 4.1			Box Elder and Total columns for 4212, 4215 and 4217.	
				154 1375 352 3056 1458 6800	179 1400 387 3091 1508 6852
123	L	4	3	Approximately 3056...	Approximately 3091...
125	Table 4.6			Framington Bay	Farmington Bay
136	R	2	7	...2306 acres...	...2341 acres...
137	R	1	16	...(dry levels)...	...(dry cycle)...
141	R	1	5	...type. An...	...type, except for 2-3 acres of wetland in the area where the pump station is planned. An...
141	R	3	3	...2620 acres...	...2341 acres...
141	R	3	7	...914 acres...	...750 acres...
144	R	3	6	...Box Elder County and the Air Force...	...Box Elder County, Tooele County and the Air Force...
165	L	2	2	...grant a right-of-way permit for use of...	...grant a license for controlled use of...
165	L	4	1	...comment of the EIS...	...comment on the EIS...
165	R	4	1	N/A	Add: <u>Bureau of Air Quality</u> The Bureau of Air Quality will need to issue a Prevention of Significant Deterioration (PSD) permit for the operation of motors that drive the pumps.

CHAPTER 4

CONSULTATION AND COORDINATION

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CONSULTATION AND COORDINATION

INTRODUCTION

The Bureau of Land Management (BLM) and U.S. Air Force requested and received consultation from many organizations and individuals, public and private, in developing the draft and final EISs for the West Desert Pumping Project. This chapter reviews this consultation process and identifies its major results.

SCOPING PROCESS

Regulations for implementing the National Environmental Policy Act (40 CFR, Part 1501.7) require an early and open scoping process. During this process, the scope of issues to be analysed related to the Proposed Action were identified. Information obtained during the scoping process was one of the sources used to determine significant issues to be addressed in detail in the EIS.

The scoping process was also used to inform affected federal, state, and local agencies and other interested persons about the proposal and to identify existing environmental reports and information related to the proposal. The basic goal of scoping was to make the EIS more concise and meaningful to those in the Federal Government who must make decisions on the proposal, those in state and local government, and those who may be affected by appoval or disapproval of the proposal or its alternative.

METHOD OF SCOPING

Notice was published in the Federal Register, Volume 50, No. 18, January 28, 1985, announcing the intent to prepare this EIS and to hold scoping meetings. Two types of scoping methods were used for the West Desert Pumping Project EIS. A mail-out scoping document was prepared and sent out to individuals, agencies, and affected parties. The list of concerned parties was developed by the Salt Lake District BLM, Utah Division of State Lands and Forestry (DSLF), and the Utah Division of Water Resources (UDWR). In addition, an intensive public notice campaign in local newspapers and radio and TV stations alerted the public to the availability of the scoping document.

Scoping meetings for selected portions of the public were also scheduled for a more intensive review of concerns. Three meetings were held on March 7 and 8, 1985, in Salt Lake City for federal and state agencies, local governments, and other involved groups. The meetings involved a brief review of the planned project, followed by small group discussions. a fourth scoping meeting was held for BLM employees at the Salt Lake District Office on March 12.

Numerous issues were identified in the scoping process. The most significant issues were the following:

-Weather Modification
-Flood Damage
-Groundwater Impacts
-Wildlife Impacts
-Mineral and Oil and Gas Leases
-Air Force Operations

DRAFT EIS CONSULTATION AND COORDINATION

The BLM had lead agency status for preparation of the draft and final EISs, with the Air Force as a major cooperating agency. The U.S. Army Corps of Engineers was also asked to be a cooperating agency. The EISs were prepared by BIO/WEST, Inc. of Logan, Utah on a third party contract between the BLM, DSLF, and BIO/WEST. The BIO/WEST and BLM interdisciplinary team that worked on the documents was noted in the List of Preparers in the draft EIS. Additional studies and analyses were conducted by Oak Ridge National Laboratory under contract to the Air Force. Their studies were used to develop impacts on Air Force property and operations in the draft EIS. Additional studies were contracted by the UDWR and primarily involved engineering design, but they

also were important in much of the EIS analyses.

Several review drafts were circulated for BLM, Air Force, Corps of Engineers, DSLF and UDWR review and comment before completion of the official draft EIS. Table 1 lists the federal, state, and local agencies, as well as legislators and individuals, consulted with in preparation of the draft and/or final EIS. Many draft EIS copies were distributed from the Salt Lake District BLM Office and DSLF Salt Lake City Office. All available copies (1500 were printed) have been distributed.

PUBLIC REVIEW OF DRAFT EIS

The draft EIS was filed with the Environmental Protection Agency on February 7, 1986, and announced in the Federal Register on January 16, 1986 (Vol.51 No. 11, page 2439). In addition, media releases were sent to radio and television stations and local newspapers in northern Utah announcing the availability of the draft EIS. Approximately 1500 copies of the document were distributed by mail or directly to individuals, organizations and governmental agencies.

COMMENTS AND RESPONSES

Twenty letters addressing the draft EIS were received by BLM during the comment period (February 10 through April 22, 1986). Additional comments were received from cooperating agencies. All letters were assigned a reference number and reviewed. Individual substantive comments (those that presented new data or questions of new issues bearing directly on the effects of the proposed action or its alternative) were identified and responded to.

Comments show a tremendous range of concerns and ideas. The scope of the EIS included the evaluation of alternatives for providing immediate flood control for the GSL, and the impacts that the three reasonable and feasible alternatives would have on the human environment. Responses are directed to those comments that deal with the three alternatives, or other reasonable alternatives, and are within the scope of the EIS process. Comments that were judged to be not within the scope of the EIS were identified with the statement: No response required. Since CEQ has authorized the State to begin construction of the West Desert Pumping Project before completion of this final EIS, comments regarding selection of other alternatives are not responded to in detail.

All comment letters have been reprinted verbatim except for their respective attachments, and all pertinent changes have been addressed in this final EIS. The responses are directly adjacent to the comments in the following section and are referenced by number.

Table 1. Agencies and organizations contacted for coordination, consultation, and review.

Federal Government

Environmental Protection Agency
FEMA, Disaster Assistance Programs Division
Fish and Wildlife Service
Bureau of Mines
Soil Conservation Service
Bureau of Reclamation
Geological Survey
National Park Service
Forest Service

Congressmen

Jim Hansen
David Monson
Howard C. Nielson
Jake Garn
Orin Hatch

Regional Government

Upper Colorado River Commission
Western States Water Council
Western Area Power Administration

Utah State Government

Board of Industrial and Economic Development
Energy Office
Bureau of Air Quality
Bureau of Mines
Bureau of Water Pollution Control
Department of Agriculture
Department of Health
Department of Natural Resources
Department of Social Services
Division of Comprehensive Emergency Management
Division of Geological and Mineral survey
Division of Oil, Gas and Mining
Division of Parks and Recreation
Division of State Lands and Forestry
Department of Transportation
Division of Water Resources
Division of Water Rights
Division of Wildlife Resources
Planning Coordinators Office

Table 1. Continued.

County and Multi-County Government

Bear River Association of Governments
Bear River County Commission
Bear River Resource Conservation and Development Committee
Box Elder County Commission
Cache County Commission
Davis County Commission
Davis County Planning Commission
Salt Lake City-County Health
Salt Lake County Commission
Salt Lake County Flood Control
Tooele County Commissioners
Utah Association of Counties
Utah Association of Soil Conservation Districts
Utah County Commission
Utah Lake and Jordan River Commission
Weber County Commission
Weber County Planning Commission

City Government

Mayor, City of Bountiful
Mayor, Brigham City
Mayor, City of Centerville
Mayor, City of Grantsville
Mayor, City of Lehi
Mayor, City of North Salt Lake
Mayor, City of Orem
Mayor, City of Provo
Mayor, City of Salt Lake
Mayor, City of Tooele
Mayor, City of Tremonton
Mayor, City of Wendover
Mayor, City of West Bountiful
Mayor, City of West Valley
Mayor, City of Woods Cross
City of Los Angeles, Department of Water and Power
Metro. Water District of Salt Lake City

Academic Organizations

Brigham Young University:
- Center for Environmental Studies
- Department of: Civil Engineering
  - Geology
  - Zoology
- Raptor Research Foundation

Table 1. Continued

University of Utah:
Department of Biology

Utah State University:
Department of: Chemistry
Civil Engineering
Economics
Forestry Resources
Wildlife Science
College of Natural Resources

Weber State College:
Department of: Geology and Geography
Zoology
Westminster College

Agricultural Organizations

American Farm Bureau
Utah Cattlemens Association
Utah Farm Bureau Federation

Environmental Organizations

Citizens Commission to Save Our Canyons
Council on Utah's Resources
Defenders of Outdoor Heritage
Defenders of Our Utah Streams and Environment
Natural Resources Defense Council
Rocky Mountain National Heritage
Save Our Rivers Committee
Sierra Club
Utah Environmental Center
Utah Heritage Foundation
Utah Nature Study Society
Utah Wilderness Association
Wasatch Mountain Club

Fish and Wildlife Organizations

American Fisheries Society
Bridgerland Audubon Society
National Audubon Society
Timpanogas Audobon Society
Utah Audubon Society
Box Elder County Wildlife Federation
Bridgerland Wildlife Federation
Davis County Wildlife Federation
Ducks Unlimited
National Wildlife Federation

Table 1. Continued

Stonefly Society
Salt Lake County Fish and Game Association
Springville-Mapleton Wildlife Federation
Tooele County Wildlife Federation
Trout Unlimited
Utah Bowmen's Association
Utah County Wildlife Federation
Utah Sportsman's Association
Utah Wildlife Federation
Utah Wildlife and Outdoor Recreation Federation
Wildlife Society

Energy/Industrial/Mineral Organizations

AMAX Magnesium
American Gilsonite
American Salt
Anax Exploration, Inc.
AT&T Long Line
Atlantic Richfield
Brush-Wellman, Inc.
Celsius Energy
City Services Oil & Gas Corporation
Coastal States Energy
Consolidated Coal
Duvall Corporation
Eagle Exploration
Energy Royalty
Getty Oil
Golden Spike Gem and Mineral Society
Great Salt Lake Minerals
H.D. Bills Exploration
Horrocks Corollo Engineers
HNG Oil
Inexco Oil
Interstate Brick and Ceramic Tile
Kaiser Chemicals
Kennecott Corporation
Mobil Oil
Morton Salt
Mountain Bell
Mountain States Resources
Murphy Oil USA, Inc.
Northwest Exploration
Pennzoil Corporation
Placid Oil
Raft River Electric Cooperative, Inc.
Republic Oil and Minerals
Solar Resources
Southern Pacific Land Company
Texaco, Inc.
Union Carbide Corporation

Table 1. Continued.

Union Pacific Railroad
Utah Mining Association
Utah Power and Light
Wasatch Gem Society

Outdoor Recreation Organizations

American Motorcycle Association
Association of Four Wheel Drive Clubs
Bees Motorcycle Club
Bonneville Nationals, Inc.
Desert Foxes Motorcycle Club
El Nautica Boat Club
GSSA Snowmobile Club
Recreation Vehicle Advisory Council
Salt Lake Motorcycle Club
Utah Salt Flats Racing Association
Utah Snowmobile Association

Water Resources Organizations

Central Utah Water Conservation District
Intermountain Water Alliance
Lower Jordan River Commissioner
Provo River Water Users Association
Citizens for a Responsible CUP
Salt Lake County Water Conservation District
Utah Water Pollution Control Association
Weber Basin Water Conservation District
Weber River Water Users Association

Other Organizations

League of Women Voters
United States Auto Club
Utah Congress Watch
Utah Geological Association
Utah Native Plant Society
Utah Resources, Inc.
Utah Travel Council

Comment Letter #1

United States Department of Agriculture — Soil Conservation Service

March 19, 1986

Mr. Jack Peterson
Bureau of Land Management
Salt Lake District
2370 So. 2300 West
Salt Lake City, Utah 84119

In reference to the DEIS on the West Desert Pumping Project I have the following comments.

1-1 On pages 79 and 117 in the SOILS section the West Desert is said to have no developed soils and no vegeration. We (Soil Conservation Service) have recently completed field work and correlation of Box Elder County, Western Part, that includes a major part of the West Desert area. From my study of the mapping units that occur below 4219 feet (west pond) I came up with approximately 2,880 acres of ZRA, 160 acres of AFA and 640 acres of SOA. I have enclosed map unit and series descriptions of these map units.

I will agree that most of the west desert floor is made up of what we identify as Playas (see enclosed description of PU). However, we do recognize that within this large area of Playas there are a few inclusions of developed soils.

My point is that to say there are no developed soils (pg 117) is a little bit misleading. I do agree that nearly all of the effected area has little or no value for cropland or rangeland and that the use of the West Desert for this purpose is not affected by the project. But, the soils such as Saltair or Skumpah will be subject to changes due to the increase in salts and permanent water. However, these changes will have little or no affect on the use of these soils.

1-2 Also, figure 3.3 - Areas with a Potential for flooding of Prime Farmland and statewide importance is a bit inaccurate. I understand that the map is small scale and used as a reference but the areas delinated are mislocated. I suggest that the Prime Farmland maps of these counties be looked at again. I have outlined in red on the map areas in Box Elder County that are Prime Farmland which have a flooding potential.

The Soil Conservation Service is an agency of the Department of Agriculture

Response

1-1 *This change has been noted in the Errata Summary.*

1-2 The maps have been reveiwed and delineations of prime or important farmlands were correct with the exception of approximately 50 acres near the Willard sewer ponds. This change has been noted in the Errata Summary. Other areas delineated on the map submitted by the respondent were above 4217, the area considered threatened by flooding in the scenarios.

Comment Letter #1

When I mention the West Desert, this refers to the area to be used by the West Desert Pumping Project.

I hope that these comments are of some help to you in the preparation of the final EIS.

Cameron Loerch

Cameron Loerch
Soil Scientist
Soil Conservation Service
Tremonton, Utah

cc: W. Lyle Reynolds, DC, SCS, Tremonton, Utah
Ferris P. Allgood, State Soil Scientist, SCS, Salt Lake City, Utah

Response

Comment Letter #2

AMAX Magnesium
238 North 2200 West
Salt Lake City, Utah 84116
801-532-2043
TLX 6711664 AMAX UW

AMAX MINERALS + ENERGY

Donald H. Wilkinson
President

March 24, 1986

Mr. Jack Peterson
Bureau of Land Management
Salt Lake District
2370 South 2300 West
Salt Lake City, UT 84119

Dear Mr. Peterson:

2-1 We have read the Draft Environmental Impact Statement (D.E.I.S.) on the proposed West Desert Pumping Project with great interest. In general, the D.E.I.S. fails to adequately analyze the environmental effects on mineral extraction industries due to removal of south arm brines to the west desert and replacement of these brines by fresh water run off into the south arm of the lake. The only provision for returning south arm salts (minerals) to the lake from the west desert is to place them in the north arm of the lake via an outlet siphon in the east pond. The statement on page 136, Chapter 4 "Environmental Consequences", Alternative 2, section entitled, "Shoreline" states:

> Proposed Configuration - Mineral extraction would be allowed to continue because the industries would not be flooded out, a significant beneficial impact. Lake brine concentrations would be similar to those under the No Action Alternative which were low due to large amounts of fresh water inflow. This could negatively affect production."

This brief analysis is inaccurate. The lake brine concentration for Alternate 2 would not be similar to that concentration under "No Action Alternate". You cannot expect to take substantial brine from the south arm to west desert pumping, thereby leaving a smaller volume at the same concentration and then add the same quantity of fresh water and have the same concentration.

Response

2-1 As noted and described in Chapter 1 of this final EIS, the State has modified the West Desert Pumping Project design and received an emergency authorization to proceed immediately with construction. The modified West Desert Pumping Project would remove water from the north arm and return it back to that arm. The deeper, denser brines of the north arm would continue to move to the south arm, as has been occurring during the last few years, by transfer of brines through the Southern Pacific Causeway. This would occur even though the flow of the less saline surface water would continue from south to north through the causeway breach. As the lake is lowered much faster by pumping than under No Action, the decreased depth of the lake will promote mixing between fresher surface brines and denser, deeper brines, which will increase surface salinity and aid mineral extraction in the south arm.

Comment Letter #2

2-1 This gap in concentration would increase year after year. An alternate discussed many times and considered practical is to bring back the west desert brine directly to the south arm, then the installation of west desert pumping would not be the mechanism by which the south shore industries would be put out of business.

If the level increases, AMAX and others can raise their dikes, as has been done in the past, but the industries cannot exist with a lower concentration resulting from increased fresh water and the effect of west desert

2-2 pumping, as conceived in this report. The effects on solar evaporation ponds by increased precipitation and lower evaporation rates due to Alternate 2 have also not been adequately addressed. It should be noted that opening the causeway has not improved the concentration of brine which is available to the south arm industries, and therefore, putting the concentrated brine into the north arm would be expected to yield similar results.

2-3 The D.E.I.S. analysis of land ownership and land use problems is equally distressing. Page 144, Chapter 4 "Environmental Consequences", Alternative 2, merely addresses concern over Kaiser Chemicals' lands in the west desert. The facts are many other persons and companies have private land and State and Federal leases which would ultimately be affected adversely by the proposed west desert pumping.

AMAX has leases extending several miles north and south of the Southern Pacific causeway. Originally, actions were taken on the west desert pumping without considering AMAX leases or discussing our joint problems. It is perplexing to see this environmental impact statement again deleting any reference to AMAX leased land, and therefore, avoiding any environmental consequence from potential interferences. AMAX intends on staying in business contrary to the statement in the Environmental Impact Statement on Page 117, "Since these evaporative industries would also be inundated by the rising lake at elevations of 4212-13, mineral production would be essentially halted for 10 - 15 years." The statement then concludes, "Therefore, the reduction in brine content would not be a major problem."

Response

2-2 Evaporation rates in the summer would be essentually the same as No Action rates. Winter evaporation rates would be slightly less than No Action levels, but the difference snould not be significant because winter evaporation is already very low. Therefore, solar evaporation ponds would not be significantly affected.

2-3 The modified West Desert Pumping Project would not effect leases north of the causeway and may prevent your having to use them by keeping the lake level down to present or lower levels.

Comment Letter #2

2-3 We cannot disagree more strongly with these statements. We will use our leases to our best advantage. The particular lease in the north was obtained in order to supply our evaporation ponds with more concentrated brine if the lake increased to a level where the concentration was inadequate. This requirement to go to the north arm with its interferences with west desert pumping will depend to some extent on where the brine is returned to the lake. It is difficult to understand how this real conflict of interest could be ignored by those promoting west desert pumping, as indicated by this report.

In summary, we have supported west desert pumping but not when there was pressure to enhance the concentration of the north arm with respect to the south arm. Discussions with the Utah Division of Water Resource personnel a year ago indicated that the cost would not be appreciably greater if the brine were put into the south arm rather than the north arm. At that time we felt such a solution might be accepted so that the lake level could be controlled without appreciable contribution to the south arm becoming fresh. The incremental cost of this alternate was small compared to the expected loss of the industries with its jobs, taxes, and so forth.

2-4 The remaining lake industries are most likely to be closed by the dilution effect that the west desert pumping , as presented, would contribute along with the high influx of fresh water. Considerable concern is expressed and additional costs provided to design the west desert pumping alternate to minimize any adverse effect on the railroads, highways, Airforce, etc. This environmental impact statement completely fails to recognize the problem that exists on the lake with the extractive industries, and therefore, it cannot accurately assess the environmental consequences of Alternate 2.

Donald H. Wilkinson
President

Response

No response required.

2-4 The extractive industries were fully considered and impacts thereto fully discussed in the EIS.

Comment Letter #3

United States Department of Agriculture
Soil Conservation Service
P. O. Box 11350
Salt Lake City, UT 84147

March 28, 1986

Mr. Jack Peterson
Bureau of Land Management
Salt Lake District
2370 South 2300 West
Salt Lake City, UT 84119

Dear Mr. Peterson:

We have reviewed the West Desert Pumping Project Draft Environmental Impact Statement. *The following are our comments:*

3-1 1. Page 79, SOILS, first column, first paragraph; does not provide any information. First column, second paragraph; addresses only the soils as they relate to agriculture. Soils have many other uses which are not addressed. These uses include sources for sand, gravel, suitability for foundations, etc. Second column, second paragraph, the statement "less important soils," is not defined.

3-2 2. Page 81, Figure 3.3; the definition for prime farmlands in Appendix B (page 166) is not current. The current definitions of Prime and Unique Farmland and State Important Farmland are attached.

3-3 3. Page 117, second column, SOILS, even if soils are not developed, if pH is below 8.8, salt water would adversely affect the soils to support plant growth in the future.

3-4 4. Page 118, Table 4.1; "Important Farmlands," are not defined.

We appreciate the opportunity to review and comment. If we can be of further assistance in providing soils information, please contact Ferris Allgood, State Soil Scientist at 524-5064.

Francis T. Holt
FRANCIS T. HOLT
State Conservationist

Attachments

The Soil Conservation Service is an agency of the United States Department of Agriculture

50

U.S. Government Printing Office 1983-420-030/1570

Response

3-1 As per the NEPA guidelines, only resources that may result in a significant impact should be discussed in the Existing Environment chapter. Therefore only agricultural soils were discussed in any deptn since only those would be impacted significantly by any of the alternatives.

3-2 The information has been updated and will be used where appropriate in the future.

3-3 Soils in the west desert have periodically been covered with salt water, hence the No Action situation should be little different than what has occurred in the past.

3-4 Please see page 79 of the DEIS.

Comment Letter #4

United States Department of the Interior
NATIONAL PARK SERVICE
ROCKY MOUNTAIN REGIONAL OFFICE
655 Parfet Street
P.O. Box 25287
Denver, Colorado 80225

IN REPLY REFER TO:

L7619 (RMR-PP)

Memorandum

To: District Manager, Salt Lake District Office, Bureau of Land Management, Salt Lake City, Utah

From: Associate Regional Director, Planning and Reaource Preservation, Rocky Mountain Region

Subject: Draft Environmental Impact Statement, West Desert Pumping Project (DEIS 86/2)

We have reviewed the subject document and have determined that the proposed project will have no effect on lands or programs administered by the National Park Service.

Richard A. Strait

Response

No response required.

Comment Letter #5

MINNESOTA
LAND SPEED RECORD
CHALLENGER

World Speed Record Association
WSRA
TEAM MEMBER

VP RESEARCH, INC
6119 Perry Avenue N
Brooklyn Center, Minnesota 55429
(612) 537-0975

April 4, 1986

Mr. Jack Peterson
Bureau of Land Management
Salt Lake District
2370 South 2300 West
Salt Lake City, Utah 84119

Dear Mr. Peterson:

I was very pleased that you sent me a copy of the Draft Environmental Impact Statement for the West Desert Pumping Project. Being involved in a racing project destined for the Bonneville salt flats, I am primarily concerned with the direct impacts on the Bonneville salt flats and the continuation of its use as a land speed racing area.

5-1 I am in favor of Alternative 3- Diking To Protect Critical Facilities. This alternative would preserve the salt flats in its now excellent state and provide a suitable location for all types of land speed racing. But I also realize this alternative would only be beneficial to the salt flats if the lake did not rise above 4215 ft. After that, flooding would be inevitable.

If the West Desert Pumping Project is implemented, for the sake of preserving the salt flats, I would like to see the pumping not begin until the lake level rose to 4212 feet. If the recent abnormal weather and rise in the lake level was just a short lived fluke, and not the start or a continuation of a rising lake level trend, I see no need for the pumping project. But if the lake should continue rising to 4215 feet, I think the pumping project would be the only viable alternative to prevent large scale flooding. Also, I am strongly against the Bonneville Pond Subalternative under any circumstances.

Please keep me posted on any developments that may directly affect the Bonneville Salt Flats. Thank you.

Sincerely,

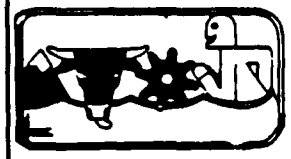
Thomas Palm

Thomas Palm

Response

5-1 The lake peaked at about 4212 in 1986. Please refer to Chapter 1 of this final EIS for a discussion of the modified design and emergency authorization. Please note that the Bonneville subalternative was not requested by the State for emergency approval.

Comment Letter #6



INTERMOUNTAIN WATER ALLIANCE

168 West 500 North
Salt Lake City
Utah 84103
801-531-7330

5 April 1986

Mr Jack Peterson
Bureau of Land Management
Salt Lake District
2370 South 2300 West
Salt Lake City, Utah 84119

Dear Mr. Peterson:

Concerning the Draft Environmental Impact Statement of the West Desert Pumping Project:

In reviewing the Draft impact statement, much new information has been conveyed as to foot by foot effects of the rising Great Salt Lake on adjacent lands. Of the three alternatives, the pumping project certainly receives the greatest attention as compared to the diking and no action alternatives. There are some impressions of costs and benefits and wetlands. It seems that all construction cost whether diking or pumping are considered as benefits (people employed, etc) whereas residential flooding costs are considered as losses. Will not a new house and lot be developed for the flooded victim and can not this flooded cost also be a construction benefit? Likewise mention is made of losses of wetlands with each option. Yet the baseline of the wetland losses is after the 1983-1984 highwater years in which over 90% of the Great Salt Lake marshes were covered with water and still are. Wetlands preservation by the various alternatives are just a small portion of the wetlands that occurred along the Great Salt Lake. 6-1 6-2

In the ideal world, man should spend more time in studying nature and trying to live within the natural world. Terminal lakes have always been difficult to manage whether here in the western United States, the Middle East, or in the Soviet Union. People tend to deplete the waters coming into the terminal lakes, forget where the lake boundaries occur, move into the lake bed, and then wonder when the wet seasons recur why they get flooded. Is there any consideration being given to maintain a 4218 feet elevation flood plain basin around the Great Salt Lake? What would be the benefits for this program-creating jobs for residential relocations? Certainly the maintenance cost would be zero and there could be wide expanses for both wildlife and recreation. It seems that if Federal funding or state funding occurs in these alternatives, a floodplain program should be instituted. 6-3

Two participants at the conference, "Problems of and the prospects for predicting Great Salt Lake levels" (enclosed in the appendix is the summary of this conference) expresses our concerns quite distinctly:

Response

6-1 The primary economic effect is the loss due to flooding. It is not known if new housing would be used by flood victims. Existing housing may be used, creating little in the way of economic benefits.

6-2 This was discussed on page 88 of the DEIS.

No response required.

6-3 No coordinated effort for rezoning the lake flood plain is known.

Comment Letter #6

Response

6-3

In focussing on the pumping and diking scheme, one could argue that Utah decision-makers are following a path of "best fit" engineering that might limit future options. The unprecedented rise of the lake in 1983 and 1984 has provided the impetus to search for quick-fix, short-term solutions. While it is always difficult to appreciate fully the pressures brought to bear on decision-makers during crises like the current lake level rise, it might be worth pointing out that the great uncertainty surrounding future lake levels probably argues against closely engineered, single-purpose solutions. Indeed, one could argue that, without some form of non-structural change in land use along the lakeshore, the appearance of "control" inculcated by the pumping and diking alternative might actually increase near-shore development and thus heighten the potential for future, perhaps catastrophic, loss if the system fails--i.e., it is not a path of "least regret".

and

A Window of Opportunity

Northern Utah's recent switch to wetter, cooler climatic conditions and the rapid rise of Great Salt Lake are certainly dramatic events, but hazards associated with climate fluctuations have occurred throughout the region's history. As short-term solutions to recent lake level increases are discussed, the opportunity arises to fulfill the requirements of the comprehensive lake management effort started in the early 1970s. Despite climate uncertainty, relatively high lake levels are likely to continue into the near future simply due to the huge influx of water in the last two years. An unfortunate combination of wind speed and direction in some near-future storm could do considerable damage on the south and east shores, turning this creeping climate hazard into a catastrophic event. The raison d'etre for rational hazard zone management around the lake is thus well established. The opportunity to develop logical and socially acceptable management plans is great. But this window of opportunity may not be open for much longer.

(from the presentation of William E. Riebsame).

Likewise presented:

It is these pending decisions that I would like to address to complete this presentation. I want to reiterate, loud and clear, that all parties involved must not by-pass non-structural alternatives. Each and every day we read or hear about the alternatives being considered; the diking, raising, and protective work along the Interstate and railroads, the pumping of water into the western desert. Dikes and pumps. There may be nothing wrong with this approach. There may be nothing wrong with a "band-aid" response program (fix-it-as-it-breaks). But there also may be nothing wrong with doing nothing at all, or doing something totally different.

Comment Letter #6

6-3

The frequency of people asking, "what if?" has diminished. What if the Interstate is raised again, and it becomes inundated again? What if it is raised again and the Lake recedes? What if the State spends $50 million to build a pumping station that is obsolete before it is completed?

We are caught in a hurry-up-we-have-to-do-something mentality. The logic being, if we don't do something now, then two years from now we will still be where we are today. I remind you of my opening quote from Mr. Austin. On the other hand, had something been done two years ago, maybe this feeling of panic wouldn't exist today.

There are still too many questions that haven't been answered. Why, now, is relocation of the Interstate just being given serious attention? Why is State and Federal money being used to subsidize housing in identified hazard areas? Was there any consideration given to the possible threat of flooding when constructing the new International Center or the expansion of the Salt Lake International Airport?

My point is, let us not forget our lessons. This is not the first time the Southern Pacific Railroad has had to face the possible loss of rail-lines due to an inland saltwater fluctuating lake. Their tracks bordering the Salton Sea have remained submerged since 1907. It is time again to institute and implement long-term management strategies for the Great Salt Lake. This event, though unprecedented in its frequency to recur, should not be the problem it is. The problem is not that the Great Salt Lake goes up and down, or that Utah has experienced consecutive abnormal patterns of precipitation, but that Man has allowed development to occur where maybe he shouldn't have. We accept a certain degree of risk with everything we do. If what we are experiencing now is the risk accepted in the past, then fine, accept it. But let's not make the same mistake twice. Two years from now, or whenever the Lake recedes, a long-term strategy should be in place, and enforced. We should define what risk is acceptable to interstates, airports, wildlife areas, recreation facilities, private housing, sewage treatment plants, mineral extraction industries, business and industrial parks, and then direct our future efforts toward operating within those parameters.

(from the presentation of Clancy Phillipsborn).

Intermountain Water Alliance strongly recommends that the floodplain of the Great Salt Lake be maintained at the 4218 foot level in concurrance with the view of most of the participants of the conference (p. 292, see appendix). All quick-fix and structural solutions should be done with this goal in mind. The floodplains management could certainly fulfil both recreational and wildlife needs for years to come.

Specific comments:

Page 18: The model chosen for the particular action is entirely arbitrary while the action is very specific. It is admitted that one must have a model for the sake of discussion. The hazard of models is that one tends to think that they are real. The appealing aspect of the 4218 ft floodplain management is that models do not come into play.

Response

No response required.

Comment Letter #6

-4-

6-4 Page 21. Alternative ponds. How much water will flow back to Great Salt Lake via ground water?

6-5 Page 66: fog and low clouds affect UTTR for "up to 15 more days than at present". Would the low level flying occur elsewhere in the Great Basin or would the fog be present in all parts of the Great Basin?

Table 2.3: Would the flooded private property that would benefit from all this flood control protection be assessed a special flood protection tax? Would the agricultural lands and the open spaces be allowed to subdivide into commercial and residential properties after receiving all all this public funded protection?

6-6 Table 2.3: 31.640 and 24415 acres of wetlands. Again it should be mentioned that this represents only 10% of the original wetlands before the 1983-1984 high water of the Great Salt Lake. The remaining wetlands are very important for the remaining wildlife but in no way can one increase the productivity of these wetlands to that prior to 1983-1984. Has the State inventoried the increases in wetlands as Rush Lake and the Sevier desert? It is very interesting to watch the pelicans, grebes, herons, egrets, avocets, silts, terns and gulls and ducks and coots on areas that a year before had only shadscale!

6-7 Page 79: "West desert flood has not developed a soil and does not support vegetaion.": Does not Allenrolfea grow there? Allenrolfea is part of the salt desert ecosystem. Are the carbonate muds a soil?

6-8 Page 80: Climate reference to Hills study: Hill's study is very important for assessing the climatic changes due to the West Desert pumping and increasing Great Salt Lake levels. It would be useful to show a map of the extensiveness of the fog in 1983 and 1984. Certainly on some days there was fog from Salt Lake City west to Pequop Summit in Nevada. Pocatello was also in the fog. How far south did the fog extend? And with the mountain breezes, the fog tends to blow further west in the evenings with Salt Lake City being clear and the Stansbury Island covered with fog. Could not fog in the west desert occur with temperature variations greater than 11 F since Hill Air Force Basin can benefit both from the canyon breezes and the temperature-moderating lake? What would happen if one looked for a temperataure spread of 22 F as an indicator of fog in the west desert? From the draft Environmental Impact Study, it would appear that Hill's study would indicate the minimal number of days of increased fog.

6-9 Figure 3.4: A very good map that is very poorly color coated! Where is the desert shrub (yellow) and barren mud flats (white). We may know locally, but in Washington, they may not know nor could they learn from the map.

6-10 Figure 3.5: Is not the entire Antelope Island the property of Utah? And is not the entire Antelope Island a State Park?

6-11 Page 107: "LDS, a faith which places strong emphasis on the family and on the establishment of community integration and mutual support in response to both individual and community-wide problems": This comment in and Environmental Impact Statement violates church and state separations. What is acceptible in an Environmental Impact Statement are social, economic and environmental impacts whatever the religion.

Response

6-4 No groundwater from the west desert ponds would enter the Great Salt Lake.

6-5 The Air Force has indicated flight could not be made up at other locations and the fog would occur around the ponds only.

No response required.

6-6 See response 6-2.

No response required.

6-7 See comment letters 1 and 3.

6-8 The amount of weather information presented in the EIS was deemed sufficient for the EIS. Copies of Hill's study and the Air Force weather study are available from the Salt Lake District Office, BLM or BIO/WEST, Inc., the EIS contractor.

6-9 Both the yellow and white were influenced by the grey background of the map.

6-10 This is correct.

6-11 If a strong religious affiliation in an affected area is a major component of the social enviroment, it is properly described in an EIS.

Comment Letter #6

6-12 Figure 4.1:shows a road connecting Hogup Mountains with Lakeside. Is this a public road? If not, it should be removed from the map.

6-13 No Action Alternative. P. 118: Lake elevation effect on climate. Will not the higher lake levels and the increase water in both the Great Salt Lake and the West Desert moderate the climatic temperature for the benefit of the fruit growers? What economic benefits will this be?

6-14 P. 126: Wildlife: There appears to be only one reference to the pelicans and the cormorants in the entire report. What will all this activity do to these birds? Will higher waters in the Great Salt Lake be beneficial inasmuch as these birds were not affected by the rising waters of 1983-1984.

6-15 P. 128: Grazing on Newfoundland Mountains: slight alteration of route between the two mountain ranges-- would these alterations be public roads for public access?

6-16 Alternative #2: p 135: Dikes of proper design: Is this possible? Just a few months ago a levee broke in Sacramento doing tremendous amount of flooding. It appears to us that any dike that is built has a likelihood of failure. Would the dikes leading to Newfoundland Mountains from the south be likely candidates for new ORV access to these mountain ranges?

6-17 P. 136: Soils: Would not the carbonate soils of the West Desert become sulfate and chloride soils after the wet season is over with the West Desert pumping? Would not these sulfate and chloride soils then tend to be a source of salt storms which could do considerable damage to Wasatch Front properties?

6-18 P. 136-137: Climate. Would I-80 ever be closed because of the increased fog from the West Desert pumping? Note that under No Action inches of water will be in the West Desert instead of Feet of water. Likewise with the pumping the water will be there throughout the entire year instead of seasonally. Would the West Desert fog affect the economy of Wendover since most of the recreational gambling traffic comes from the Wasatch Front? Does the present fog in the West Desert come from Great Salt Lake or from temperature inversions and ground moistures and the water on the ground?

6-19 P. 140: Explain how proper designed dikes will not crack? Why dike at all if the dikes are going to leak? Is not this built-in failure?

6-20 P. 141: Vegetation: Desert shrub/saltbush and greasewood types " are widespread and unimportant" in the west desert but on page 142 they become thousands of acres which would be protected for wildlife from flooding and constitute "some of the last remaining habitat along the Great Salt Lake". Can you explain this to us? Perhaps the reviewers should read Fautins work (R.W. Fautin, 1946. Biotic communities of the northern desert shrub biome in weste. Utah. *Ecological Monographs* vol 16: 251-310). It seems that in the West Desert that the desert shrub and Allenrolfea is not appreciated for wildlife. Perhaps there should be more BLM and Utah funding of basic research in these areas to determine what the destruction of the carbonate soils, the Allenrolfea, the desert shrub, and greasewood would do to the region.

Response

6-12 The road is associated with the Southern Pacific grade across this area, is not public, but is appropriate for the map.

6-13 Temperature during the summer would not be appreciably affected, but the natural storminess associated with continued lake rise could have an affect on temperature.

6-14 Neither of these species would be significantly affected by any of the alternatives.

6-15 The routes are not roads, just trails across the mud flats. Vehicular access to the Newfoundlands is presently private and this project would not change this situation.

6-16 The State's modified dike designs took into consideration reasonable risk of failure. The possibility of west desert dike failure was analysed for the EIS but failure was determined to not cause significant impacts since little of value would be flooded. Access across the Newfoundland Dike would be restricted since it is in the UTTR.

6-17 A major component of the West Desert Pumping Project is winter flushing of the ponds to prevent or reduce salt buildup in the west desert. Salt deposition should occur only in a few isolated bays of the pond where circulation is poor. Therefore, salt storms would be little different than at present.

6-18 Fog would effect I-80, but probably not close it since I-15 has seldom been closed in recent foggy winters. The economy of Wendover should not be significantly affected. All of the factors mentioned may contribute to winter fog in that area.

6-19 As indicated on page 140 of the draft EIS, cracking would cause only limited leakage and the dikes would remain fully functional.

6-20 The desert shrub along the east shore (p. 142) serves as habitat for some displaced wetland species as well as species, such as pheasant, that also use adjacent agricultural land. Desert shrub in the west desert does not support this type of wildlife use since adjacent habitat is not as valuable to wildlife as that along the east shore.

Comment Letter #6

6-21 Page 141: could carp and speckled dace live in the ponds in the west desert? What data do you have which indicate that ponds would exist in the West Desert under No Action in view of the rise in Great Salt Lake largely occurs from the run-off from the Wasatch and Uinta Mountains to the east? Is there a chance in the contrary situation that water would be pumped to a region that is already filled and overflowing into the Great Salt Lake?

6-22 Page 146: *Would not an elevated I-80 serve as a dike? One can pass Utah Lake* now and know not that it exists as one goes between two dikes. This does not do much for scenic Utah! It seems that over the years the management plan for the north side of I-80 was to be free of any intrusions for tourism and for preservation of the Donner Party route, the views of the Bonneville Salt flats and the Silver Mountians. Certainly a dike would cut out a lot of the vistas. Would it lead to more drowsey drivers and more accidents.

6-23 P. 147: Social conditions: REcreation: would the construction crew have unlimited recreational access to the Newfoundland Mountains that is denied to the general public because of the lack of public access? Would any of the fresh water on Newfoundland Mountains be utilized for the contruction project?

6-24 P. 148: *Economies: How many jobs would be created by No Action- with new* demand on housing? Would the reduced cropland help solve the balanced budget of the Federal government with less subsidies payout and reduced surpluses?

6-25 Alternative #3. P. 152: Wildlife: would the inlake dike allow for new species to immigrate to Antelope Island and disturb some of the insular species that now live on Antelope Island?

6-26 P. 154: Recreation: would dikes by used for ORV use?

6-27 P. 155-156: Social conditions: Would Inlake diking create an odoriferous atmosphere that would be intolerable and even poisonous to the Wasatch Front populations? Would this atmosphere prohibit recreation on Antelope Island?

Intermountain Water Alliance recommends the following mitigation measures for the problems at hand-

6-28

1) Obtain the paleoenviornmental data as recommended by the attendees at the conference on predicting levels of Great Salt Lake (The summary of this conference is attached to this statement).

2) Use I-80 as a dike in the West Desert for tourism.

3) Allow no access to Newfoundland Mountains by construction crew or public unless full public access from Lakeside is available.

4) Establish 4218 foot level as floodplains under all alternatives and prohibit any new development from occurring in this floodplain. Start removing existing residential units from the floodplain. Manage the floodplain for recreation and wildlife.

5) Let industry defend itself. Southern Pacific lines were flooding and abandoned in the Salton Sea and it was their choice of rerouting across the Great Salt Lake.

Response

6-21 The ponds, just like the Great Salt Lake, would be too salty for fresh water fish. Weather patterns that affect the Wasatch Front generally pass over the west desert mountain ranges as well, and considerable ponding has occurred during the last few years in the west desert. The natural flooding would not fill the west desert area planned for the West Pond.

6-22 I-80 would not serve as a dike without extensive modification. The Bonneville Dike would only be a few feet above ground level and often below I-80, and therefore would only occasionally block views to the north.

6-23 Construction crews would have to obtain permission to use the private road to access the Newfoundlands just as the general public must at present. Freshwater from that area would not be used for construction.

6-24 Please see Response 6-1. Government cropland subsidies would be insignificant.

6-25 The inlake dike would allow for such immigration but it is highly unlikely that disturbance to insular species would occur.

6-26 These dikes would not be subject to BLM regulation. It is uncertain whether they would be open for ORV use.

6-27 Available information indicates odors may be a problem, but the degree of the problem is not known.

6-28 These comments were considered in the final EIS.

Comment Letter #6

6-28 6) Determine how many jobs and benefits from those jobs would occur with the floodplain management proposal.

7) Allow for scientific flights to occur over the west desert to examine the geological profiles and the biological profiles and to photograph these profiles for geographical and biological data base.

We realize that the problems of the rising Great Salt Lake have many solutions. It seems that an engineering solution seems to be very popular in the State of Utah (Man conquers Nature approach). Yet engineering solutions to unstable environments as terminal lakes may well create more problems in the future and have far greater costs to society.

Sincerely,

Peter Hovingh

Response

Comment Letter #7

M. Sid Allsop, P.E.
Consulting Engineer
51 West Westview Drive
Orem, Utah 84058
Phone (801) 226-0989

April 7, 1986

Mr. Jack Peterson
Bureau of Land Management
Salt Lake District
2370 South 2300 West
Salt Lake City, Utah 84119

Dear Mr. Peterson:

7-1 I have reviewed the Draft Environmental Impact Statement (DEIS) on the proposed West Desert Pumping Project and find that one logical alternative has not been adequately considered in the report. That is the **Bear River to Portneuf River Diversion Project.** This project has been investigated and a report prepared for the Utah Division of Water Resources. It was concluded that it is physically possible to divert water from the Bear River near the Alexander Reservoir in Idaho, into the Portneuf River which is a tributary of the Snake-Columbia River System. In this study, five alternative schemes were considered. I do not have the main text of the report, however as I understand it from the report Appendix, which I was able to obtain from DNR, the **Alexander-Canal - Pebble** alternate is the least expensive of the five and is estimated to cost $43.15 million.

It is stated on page 63 of the DEIS that this diversion could cost as much as $185 million and take 4 years to construct. It appears that it might also be as little as $43.15 million (for the 1800 cfs diversion rate) and I suggest perhaps one year to construct.

I consider an EIS on a project to prevent flooding around the Salt Lake to be incomplete that does include this as one of the alternates. There are many aspects of this alternate that should be considered, part of which are as follows:

1. Can enough water be diverted to provide the necessary control for the level of Salt Lake, or if not enough to provide total control, how much control would be provided. As I understand it, this diversion probably would provide the necessary control. The required releases for irrigation purposes would be maintained but not enough water would be released to add unwanted flow into Salt Lake when we are in a wet cycle such as we

63

Response

7-1 The Portneuf River Diversion was reviewed in considable detail for the EIS. Reasons for not including it in more detail can be found on page 63 of the draft EIS.

Comment Letter #7

Response

7-1 are in now. It is stated on page 63 of t[illegible] DEIS that the project would reduce the level of Salt Lake by 12 inch[illegible] this can be done annually and if we started in 1982 we could now have the lake 5 feet lower (4206) than it is and this would be without pumping

2. The power generation downstream on the Bear River is probably not very significant compared to other factors. It is interesting to note that much more power could be generated by diverting into the Snake River than can be generated in the Bear River inasmuch as power is generated down to about elevation 900 on the Snake and it can only be generated down to about elevation 4230 on the Bear River. This requires some work with power companies however the end result might makes the effort worthwhile.

3. The advantage of this alternate over other alternates is that of providing a permanent solution to the problem. The ability of the Salt Lake pumping project as presented in the DEIS to control flooding is diminished each year if the flow into Salt Lake continues at a high level for several years. The same is true for the Diking to Protect Critical Facilities Alternate.

4. With the Bear [illegible]ver Diversion Alternate, there would be no adverse impact on the West Desert, the dreaded "lake effect" would not be increased, the Air Force Training Range would not be affected and the industries around the lake would be able to operate with a more consistent high mineral lake water quality.

It is realized that the "Bear River to Portneuf River Diversion Project " involves inter-state agreements and right of way problems, however, the advantages justify the means.

With all due respect to the interest of time in getting some solution to this mammoth problem, it is requested that this alternate, the **Bear River to Portneuf River Diversion project** be studied and included with the other alternates before a final EIS is accepted.

Sincerely

M Sid Allsop

M Sid Allsop P.E.

Comment Letter #8

Ogden
AREA CHAMBER OF COMMERCE

April 10, 1986

CC: Mr. Jack Peterson
BUREAU OF LAND MANAGEMENT
Salt Lake District
2370 South 2300 West
Salt Lake City, Utah 84119

The Honorable Norman Bangerter
Governor of Utah
State Capitol, Room 210
Salt Lake City, Utah 84114

Dear Governor Bangerter:

8-1 We plead with you once again to immediately initiate west desert pumping. You must actively address the serious flooding of the Great Salt Lake. Transcontinental highway and rail lines are seriously threatened and hundreds of jobs are going to be lost.

Pumping may have seemed like an expensive gamble ten years ago but not today. We are about to witness far greater impacts on the industrial and economic base of the state.

Direct impact from lake flooding is going to be more than $1 billion. Damage figures have already multiplied far beyond what "West Desert Pumping" would have cost had we taken effective action years ago.

We are facing a dilemma of immense proportions; the immediate destruction of Utah's transportation system. Without westward rail service from Ogden we will lose the competitive rail transportation system Utah has enjoyed for more than a century. How can we possibly court the Pacific Rim nations without the railroad? How can we justify courting Japanese business when our own industries are so clearly threatened?

The demise of one of our major rail lines will bring higher freight rates and impact every citizen. The results will be disasterous among Utah companies far away from their major markets. Government indecision on pumping to the desert is sending the message that we are abandoning our existing industries.

The importance of the Southern Pacific line across the lake has long been recognized by the State of Utah. You have supported Denver and Rio Grande Railroad's acquisition of SP track west of Ogden as a condition to be met before any ICC merger approval between the Santa Fe and Southern Pacific.

ACCREDITED

2307 Washington Blvd. • Ogden, Utah 84401 • Phone (801) 621-8300

Response

8-1 Subsequent to receiving emergency authorization, the State has initiated construction of the modified West Desert Pumping Project.

No response required.

Comment Letter #8

The state successfully fought the federal government to obtain ownership of the lake, believing in the potential benefits for the people of Utah. We can still recall how the politicians all claimed individual victories for having secured the greatest windfall in the state's history. The ownership is not conditional. The state must accept responsibility for the lake.

Leaving the private sector and local government to fend for themselves might seem to be in the spirit of the present time, but any private initiative has technical limits and cannot control a public body of water.

We sense that the decision on pumping is being held as a political hostage. When it is safe to say "yes" on pumping it will be too late. Being out of work is a far worse tragedy than having to pay higher taxes.

We are rapidly running out of time. In 1984, we and the Salt Lake Chamber agreed to support a breach of the causeway if the the state would take immediate affirmative action to control the lake. The breach has been accomplished and the lake is still rising. A few days of sunshine has not altered the fact that we are still in a wet cycle. There is no actual weather data to support a belief that the flooding will diminish.

The time for decisive leadership and action is now. Our state cannot sustain further losses. Jobs are at stake and the future of our citizens rest on your decision.

Sincerely,

Steve Lawson
President

SL/np

Response

Comment Letter #9

Southern California Timing Association, Inc.
Bonneville Nationals, Incorporated

Mr. Jack Peterson
Bureau of Land Management
Salt Lake District
2370 West 2300 West
Salt Lake City, Utah 84119

Dear Mr. Peterson,

9-1 The Board of Directors of The Southern California Timing Association and Bonneville Nationals Inc. has reviewed the Draft Environmental Impact Statement concerning the proposed West Desert Pumping project and has unanimously agreed that alternative 2 would affect the usability of the Bonneville Salt Flats. We do not agree that alternative 2 is similar to no action (alternative #1) since the Salt Flats are usable under present conditions. Alternative 2 would also create a windfall production increase for the Kaiser Chemical Co. due to the increased brine flow supported by tax dollars.

9-2 Alternative 3 seems to be the most logical and cost effective choice in terms of protection to critical areas.

Respectfully Submitted:

Jim Lattin- President Southern California Timing Association

Monte Wolfe-Chairman of The Board Bonneville Nationals Inc.

"SPONSORS OF THE WORLD'S *Fastest* AUTOMOTIVE SPEED TRIALS"

Response

9-1 Please see chapters 1 and 2 of this final EIS where impacts to the Salt Flats for No Action have been modified to reflect this comment. Also note that the lowered West Pond elevation of 4217 may not effect the use of the Salt Flats during late summer and fall.

9-2 See Response 8-1.

Comment Letter #10

NIELSON INTERNATIONAL ENERGY, INC.

3490 Monte Verde Drive, Salt Lake City, Utah 84109
Phone (801) 278-9450

April 18, 1986

Mr. Jack Peterson
Bureau of Land Management
Salt Lake District
2370 South 2300 West
Salt Lake City, Utah 84119

Subject: Happy Solution to Lake Problem

Dear Mr. Peterson:

10-1 I just received a copy of the report on the West Desert Pumping Project. I notice your invitation for response expires April 22.

I do not have time for a comprehensive presentation of our proposal but following is a brief outline of the highlights of our concept of what should be done.

Attached is a copy of Sketch No. NR-4. Also refer to "Report of Reconnaissance of the Use of Puddle Valley for Lake Level Control and/or Peaking Power Generation," prepared by Utah Water Resources Laboratory, Utah State University, Logan, Utah.

We are proposing that during the next six years, 10 million acre-feet of water be taken from the Bear River just south of Bear River City and piped through two 20-foot diameter 60-mile long sulfur concrete pipes to the west side of the Great Salt Lake, then pumped through a 3.5-mile tunnel and lifter between 150 and 300 feet into Puddle Valley. This should eliminate all the lake flooding problems and save hundreds of millions of dollars in damages. It would provide a pond of fresh water worth at least half a billion dollars, at a total cost of not to exceed $200 million.

This would provide Salt Lake County with all the water they need in the foreseeable future, also Tooele City and much of Tooele County, which is not scheduled to receive a drop of water from the CUP. This would allow that Provo could have the water they are suing for without any further argument. It would eliminate the need for the highly risky and expensive Jordanelle Dam which should never be built because of the high risk of wiping out much of the BYU Campus and students and Provo City by breakage of the dam by natural breakage, earthquakes, or sabotage from Church enemies or foreign enemies. Also it would eliminate the need for the Little Dell Dam.

Where will the money come from? The Jordanelle Dam is estimated to cost $600 million. One-third of the money saved there would do this entire job.

Response

10-1 No response required. The proposal was not evaluated in the EIS and therefore was outside the scope of this document.

Comment Letter #10

Mr. Jack Peterson
Bureau of Land Management
Subject: Happy Solution to Lake Problem
Page 2

Also $60 million could be saved by eliminating the Little Dell Dam. The state has $30 million and is going for another $25 million. The Salt Lake Water Conservancy District has published that they are ready to buy water for the future even if they get the CUP water. Tooele City and County have expressed a desire and need for much more water than they now have. From preliminary discussion it appears the Southern Pacific Railroad may be willing to loan money to help out in order to save their causeway. Perhaps the Western Pacific Railroad would do likewise.

We propose the pumps be driven by steam pressure directly with coal-fired steam boilers. This would eliminate expensive electric generators, motors, switch gear, and transmission lines. Coal could be trucked or hauled by rail from the least expensive source to the Saltair vicinity and dumped into a barge and transported across the lake to the pumps inexpensively.

Respectfully,

NIELSON INTERNATIONAL ENERGY, INC.

Jay P. Nielson

Jay P. Nielson, President

JPN/bn

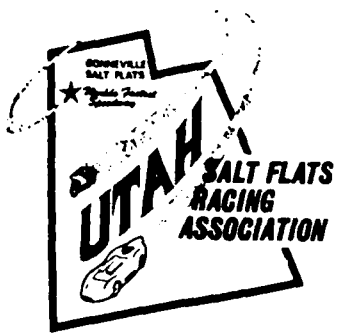
Enclosure (Sketch No. NR-4)

CC: Governor Norman Bangerter

Response

No response required.

Comment Letter #11



DEAR, JACK 4/18/86

11-1 IN REVIEWING THE INFORMATION YOU SENT US ON THE WEST DESERT PUMPING PROJECT. WE ASK THAT YOU NOT PUMP THE GREAT SALT LAKE ONTO OR NEAR THE BONNEVILLE SALT FLATS.

11-2 PLEASE CORRECT PAGE 103 OF YOUR STUDY, THE B.S.F. IS A CLASS 2 NOT A CLASS 3 AREA.

THE BONNEVILLE SALT FLATS IS LISTED ON THE NATIONAL REGISTER OF HISTORICAL PLACES A.C.E.C.

PLEASE REVIEW 1984 M.F.P & R.M.P. SEE GREGG MORGAN

WE ARE PREPAIRED TO TAKE LEGAL ACTION IF NEEDED. WE WANT TO PRESERVE THIS AREA FOR FUTURE USE!

THANK YOU

U.S.F.R.A. PRES. Larry Volk
801-292-5425

540 EAST 500 NORTH • PLEASANT GROVE, UTAH • 84062

Response

11-1 See response 9-1.

11-2 This change has been made in the Errata Summary.

No response required.

Comment Letter #12

A. Lee Foote
Dept. Natural Resource
Utah State University
UMC 52
Logan, Utah 84322

Mr. Jack Peterson
BLM
Salt Lake Districts
2370 West 2300 West
Salt Lake City, Utah 84119

15 April 1986

Dear Sir:

I have completed reading the Draft Environmental Impact Statement for the West Desert Pumping Project and would like to raise several questions and make several statements. The investigation carried out by Bio/West appears to have been done accurately and objectively and I have no problem with the manuscript execution at this time.

12-1 Although it may be beond the scope of this EIS, a critical consideration prior to building this pumping station will rest on specifying exactly who will have control and/or influence over it's use. An estimated pumping cost of $3,500,000 annually may become something of an albatross after a decade or more. The obvious thought which I have not seen mentioned is the possiblity of designating part of the flooded west desert area as brine reclamation ponds. The mineral extraction industry in this area is out of work at present anyway and would possibly be interested in buying brine and desert space to dehydrate it. This may help offset pumping costs but will require additional environmental considerations.

Response

12-1 This possibility has been discussed with the State, and may be practicable although a major consideration in the plan is to circulate the brines through the pond and back to the lake to prevent salt precipitation in the west desert. Also, it is not known if mineral industries would be interested in developing a short-term resource, since the pumping may only last for a few years.

Comment Letter #12

12-2 The EIS gave extensive coverage and predictions of detrimental effects of increased precipitation, humidity, and fog resulting from increased evaporative surface. Because much of the area involved in the "lake effect" closed basin is considered arid range land or irrigated crop land, it is quite possible that there will be some positive effects resulting from precipitation increases. Increased range-soil moisture, improved ski area snow conditions, and reduced agricultural pumping costs should be considered partial mitigation for the deleterious effects discussed.

12-3 Due to their inaccessability, the Newfoundland mountains are viewed by non-motorized recreationists as a wilderness-like area. The road improvements required for spoil hauling will improve access into this area and may be expected to increase ORV usage and possible compromise the quality of wildland experience for some low impact users. This deserves mention and I encourage the consideration of a plan to leave access to all areas possible in as near the original condition as possible.

Sincerely

A. Lee Foote

A. Lee Foote

Response

12-2 It is doubtful the benefits would be significant since during most years when pumping would occur, high precipitation would occur anyway.

12-3 The routes to the Newfoundlands would be controlled by the Air Force (Newfoundland Dike) or Southern Pacific Railroad (northern route), and both would require permits for public access as they do at present.

Comment Letter #13

QUICK REPLY LETTER

VESCO'S, INC.

1100 SO. MAIN STREET   BRIGHAM CITY, UTAH 84302

(801) 734-9424

TO ALL [illegible] → SUBJECT Canyon Lands & West Desert Pumping

MESSAGE   DATE 4/9/86

Canyon Lands;

Please keep Canyon Lands open to off highway vehicles for the current trail system. Restrictions are needed in some areas as you know, but I am not able to hike on foot & the off road machine allows me to see the sites. Total wilderness [illegible] is not good. Thanks

West Desert Pumping: Don't mess with mother nature. Building to close to the [illegible] Salt Lake was bad planning and so might it be true in this pumping project. [illegible] dikes may break and flood out mother natures most perfect surface, the Bonneville Salt Flats. The dirt from the dikes (even if they don't break) may wash across the flats and destroy the fragile surface. Do not pump to the West Desert. 13-1

O/C. to Jake Garn

SIGNED [signature]

REPLY

DATE

SIGNED

Response

No response required.

13-1 Please see Response 9-1.

Comment Letter #14

116 State Capitol Building
Salt Lake City, UT 84114
Telephone 801-533-5245

office of planning and budget

Norman H. Bangerter, Governor Dale C. Hatch, C.P.A., J.D., Director Michael E. Christensen, Ph.D., Deputy Di

April 21, 1986

Mr. Jack Peterson
Bureau of Land Management
Salt Lake District
2370 South 2300 West
Salt Lake City, Utah 84119

Dear Mr. Peterson:

The Resource Development Coordinating Committee has reviewed the West Desert Pumping Project Draft Environmental Impact Statement and submits the following comments for your consideration.

I. Transportation

Interstate Route 80 between Knolls and Wendover is a very fragile link in the country's most important east-west freeway. The parallel Union Pacific Rail Line is also critical to the economy of the region; consequently, the Utah Department of Transportation (UDOT) is very interested in any action that could jeopardize these facilities.

14-1 Proximity of the east-west component of the Bonneville Dikes (first shown on page 23 of the DEIS) to the freeway is of great concern. There should be a minimum of a quarter-mile between the freeway and the dike for two reasons:

(1) Some measure of protection in case there is a catastrophic failure of the dike;

(2) To allow surface water, primarily drainage from the south which is presently carried under I-80 via culverts, to flow to the low spot near Arinosa some 5 to 10 miles to the west.

14-2 Although adequate freeboard is allowed in the dike design (DEIS page 26 and 29), the 3:1 slope will not offer adequate stability against wave action. The experience of UDOT in lake diking is that a dike constructed to a 6:1 slope will eventually "beach" to a 10:1 slope.

14-3 There was no discussion describing how block-clay cracks are to be handled. These cracks (DEIS page 83) extend many feet below the surface and are likely to permit extensive seepage under any dike constructed on a clay base.

Response

14-1 *These concerns are being taken into consideration by the Utah Division of Water Resources in consultation with the Utah Department of Transportation in the final design of the Bonneville Dike.*

14-2 The present design of the Bonneville Dike calls for armoring to prevent wave action deterioration. This was done in part because only a small portion of the dike will have water against it on a continual basis, and costs will be less for a 3:1 design.

14-3 *Please refer to pages 139 and 140 where cracking associated with the Bonneville Dike is discussed. Also see Response 6-19.*

Comment Letter #14

Although the Southern Pacific Railroad is not directly a responsibility of the UDOT, it does provide another essential transportation link. The Railroad's concerns should be carefully addressed in this project. Overall, more effort is needed to establish the position of the Bonneville Dikes in relation to I-80, as outlined above. Also, it appears that dike design needs to be much more substantial (and consequently more expensive) than contemplated in the DEIS.

14-4

II. Minerals

In the discussion of shoreline oil and gas resource, the document mentions that these resources have been developed in a limited manner in the past (DEIS page 75). It should be noted that there are small defunct oil processing facilities still in place in the area of Rozel Point which have been adversely affected by the rising level of the Great Salt Lake. Additional increases in the lake's level will only compound the problems of clean-up and reclamation of these sites.

14-5

In addition to past oil and gas exploration conducted by both AMOCO and small operators in the Great Salt Lake, there is currently renewed interest being expressed in lake bed exploration by a new lessee of several State oil, gas and hydrocarbon leases. These plans would definitely be impacted by rising lake levels and by decisions to mitigate flooding. Because these exploration plans have not been fully prepared, and evaluated, very little can be addressed in the DEIS other than to mention that oil and gas development in and around the Great Salt Lake remains a viable industry.

III. Geology

14-6

The following comments are editorial changes that are offered to assist in wording the document more precisely.

Page 5, Alternative 2, First Sentence: ". . . most of the area impacted is mud flat." Change flat to flats.

Page 73, Geology, First Paragraph: Rewrite the second sentence to read, "Hydrologic contribution to the 'closed' GSL basin exit by evaporation only. Contributing streams also transport large amounts of sediment in a broad range of size fractions."

Page 74, Shoreline, Second Paragraph: The following changes are recommended. First sentence, "The upper shoreline deposits of Lake Bonneville. . ."; second sentence, "These sediments were transported by mountain streams. . ."; third sentence, "The finer sediments were carried farther into the lake. . ."; fourth sentence, "Valley floors

Response

14-4 Very little water would actually lay against the vast majority of the Bonneville Dike. This would occur because the West Pond elevation has been lowered to 4217 (see Chapter 2 of this document).

14-5 The updated information is included in the Errata Summary.

14-6 The recommended editorial changes are appreciated but will not be included since the draft EIS will not be reprinted.

Comment Letter #14

Page Three
Mr. Peterson

14-6 are presently underlain by thousands of feet of sediment deposited in lacustrine and fluvio-lacustine depositional environments and transitional environments."

Page 74, Shoreline: End the Shoreline section with the second paragraph. Start a new section headed "Structure and Tectonics" with the sentence "The GSL is located on the transition. . ." Change the second sentence of that paragraph from "A scattered pattern of faults. . ." to "Past tectonic activity is evidenced by *north-south trending faults from southern Idaho to. . .*" The second paragraph of the new section, third sentence, should read, "Most of the earthquake zones contiguous to the GSL. . ."

Page 75, Mineral Resource, Paragraph 2: Rewrite the sentence to read, "However, because of the remote location of the mountains and the high cost of. . ."

Page 75, Shoreline, Paragraph Two, Second Sentence: Rewrite the sentence to read "Several shallow wells have been drilled at Rozel Point on the west side of the Promontory Mountains where oil seeps have been noted. . ."

Thank you for this opportunity to comment on the DEIS.

Sincerely,

Michael E. Christensen

Michael E. Christensen
State Planning Coordinator

MEC/jd

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Response

Comment Letter #15

MORTON THIOKOL INC.
Salt Group

Lyndon H. Kressel
Vice President
Salt Group Operations

April 21, 1986

Mr. Jack Peterson
Bureau of Land Management
Salt Lake District Office
2370 South 2300 West
Salt Lake City, UT 84119

Dear Mr. Peterson:

In my letter to you of March 14, 1985 we submitted comments to be considered in the scoping process for the West Desert Pumping Project. The draft Environmental Impact Statement for the West Desert Pumping Project of February, 1986 has been reviewed and we submit the following comments.

Alternate 1

The DEIS states "In all likelihood if permits for the West Desert Pumping Project are denied or if impacts are too great, diking as described in Alternate 3 would occur along with additional private and local government diking." Rather than assuming that Alternate 3 would be implemented, see Morton Salt's comments on Alternate 3.

Alternate 2

15-1 The DEIS states "All the remaining mineral industries around the GSL would be protected from flooding, allowing for considerable benefits from protection from loss of capital facilities, loss of production and loss of jobs." However the DEIS also states "Lake brine concentrations would be similar to those under the No Action Alternative which were low due to large amounts of fresh water inflow. This could negatively effect production." Furthermore, the DEIS states "During periods when the Lake is rising and is at high levels precipitation fog and low clouds would typically be above normal levels (wet cycle), while with West Desert Pumping there would be added increase in frequency and intensity of these weather elements." While the plants themselves would remain there is a serious question as to whether they would still be economical to operate.

110 North Wacker Drive Chicago Illinois 60606-1556 (312) 621-5384

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Response

15-1 See Responses 2-1 and 2-2.

Comment Letter #15

Mr. Jack Peterson
Bureau of Land Management
April 21, 1986
Page 2

15-1 The problem could well be solved by returning the concentrated brine from the West Desert to the South Arm rather than to the North Arm or by opening the causeway to allow free return of the brine from the North Arm to the South Arm.

It is understood that the cost of returning the brine to the South Arm would not be appreciably greater than returning the brine to the North Arm. This would result in both the Lake level being controlled and the impact on the South Arm being minimized. The incremental cost of this subalternate is believed to be small compared the expected loss of the mineral industry with its jobs and taxes.

Alternate 3

15-2 For the primary alternate (not the inlake subalternate) it is not clear from the DEIS what would happen to the flow through the Brighton Drain, the C-7 Canal or the Ritter Canal. If they were pumped down to 4210' by others, then Morton Salt's facility would remain intact. However, the salinity of the Lake could be so low as to make salt production uneconomic.

15-3 The subalternate of inlake diking would wreak further havoc for Morton Salt. The already weak brine would be further diluted by placing the discharge from the Jordan River near Morton Salt's brine intake.

15-4 Overall while the proposed West Desert Pumping scheme may solve the flooding problem it may not provide brine of sufficient salinity for the South Arm mineral industry to remain in business. The socio-economic impact on AMAX Magnesium, American Salt, Sol-Aire Salt, Morton Salt on their respective employees and on the economy of Salt Lake and Tooele Counties has not been considered. Sufficient brines must be allowed to return directly to the South Arm or through adequate breeches in the causeway so that the mineral extraction industries on the South Arm can survive. It appears that this can be accomplished at only a modest cost increase.

The DEIS has inaccurately assessed the impact of Alternate 2 on the South Arm mineral industry. The reduction in brine salinity would be critical and must be addressed. A fresh

Response

15-2 It was the assumption of the DEIS that drains and canals would be backed up, but otherwise would function as they do at present.

15-3 This may be correct. Additional environmental documentation would be required before the inlake dike could be constructed and this concern would be analysed in that document.

15-4 See Responses 2-1 and 2-2.

Comment Letter #15

Response

water lake will not produce salt, no matter how safe the shore is from flooding.

Yours very truly,

L. H. Kreisel
Vice President
Salt Group Operations
Morton Thiokol Inc.

cep/041786

Comment Letter #16

UTAH POWER & LIGHT COMPANY
1407 WEST NORTH TEMPLE STREET
P. O. BOX 899
SALT LAKE CITY, UTAH 84110

LEGAL DEPARTMENT
JODY L. WILLIAMS
ATTORNEY AT LAW
801 - 530-5031

April 21, 1986

Mr. Jack Peterson
Bureau of Land Management
Salt Lake District
2370 South 2300 West
Salt Lake City, Utah 84119

Re: Draft EIS for the West Desert Pumping Project

Dear Mr. Peterson:

Utah Power & Light Company thanks you for the opportunity to comment on the draft EIS for the West Desert Pumping Project, dated February 1986. Utah Power & Light Company has two brief comments.

16-1

1. In your section entitled "Alternatives Considered But Eliminated From Detailed Study," on page 63, upstream projects are considered. The draft environmental impact statement notes that upstream reservoirs on the Bear River would cost approximately $400 million to build and would take up to 20 years or more to be completed. Utah Power & Light Company has cooperated extensively with the Utah Department of Water Resources in its studies of upstream storage on the Bear River. All cost data from UDWR, probably including the $400 million cost figure in the Draft EIS, do not include the additional costs for replacement of Utah Power & Light Company's hydroelectric projects which would be affected by any upstream development on the Bear River.

   While Utah Power & Light Company does not object to plans for upstream storage on the Bear River, especially for municipal water development, any serious plan considering upstream storage must consider and quantify costs to mitigate impacts on or replace Utah Power & Light Company's hydroelectric projects on the Bear River and Utah Power & Light Company's water rights.

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Response

16-1 It is anticipated that these concerns would be addressed in any environmental documentation for those projects.

Comment Letter #16

Mr. Jack Peterson
Page Two

16-1 At best, upstream storage on the Bear River is a partial solution which would take many years to construct.

16-2 2. In your alternative three - "Diking to Protect Critical Facilities," you note that Utah Power & Light Company has already constructed a private dike to protect its powerline near Centerville from ice damage. Utah Power & Light Company supports a long term solution to the rising level of the Great Salt Lake so that it will not have to continue to construct dikes to protect its facilities.

16-3 The final EIS should also consider ice damages to private facilities as well as damages from flooding and a high water table.

Utah Power & Light Company appreciates the opportunity to comment on the Draft EIS, and by this letter requests a copy of the final Environmental Statement to be sent to me at the address listed above on this letterhead.

Thank you very much.

Very truly yours,

Jody L. Williams

Jody L. Williams

JLW:sce

Response

16-2 See Response 8-1.

16-3 Although ice damage was not mentioned specifically, damages noted in the draft EIS included damage by ice.

Comment Letter #17

WEYHER/LIVSEY CONSTRUCTORS, INC.

Post Office Box 628
Salt Lake City, Utah 84110
(801) 521-7030

April 22, 1986

Mr. Jack Peterson
Bureau of Land Management
Salt Lake District
2370 South 2300 West
Salt Lake City, Utah 84119

Reference: West Desert Pumping Project

Dear Sir:

Weyher/Livsey Constructors, Inc. of Salt Lake City, wholly owned subsidiary of the Dravo Corporation, Pittsburgh, Pennsylvania, in conjunction with Wasatch-Dynalectric of Salt Lake City, have put together for your consideration the following proposal on a pumping station for the West Desert Pumping Project.

This team of Weyher/Livsey and Wasatch Electric designed and put in place within two weeks the emergency pumping station for the Lake Thistle disaster in 1983.

This proposal is for a pump station to be designed, constructed and operated by us that will start pumping water within six months of notice to proceed at a capacity of 1 million acre feet per year and three months later the full pumping capacity of 1.7 million acre feet per year.

17-1 Our proposal is based on using electrical power for pumping instead of diesel as suggested in the Environmental Impact statement. According to the Environmental Impact statement, diesel was selected because of the large investment required for a transmission line to deliver electrical power to the pumping site. Electrical power, at a very competitive rate, is available from Raft River REA at a point approximately three miles from the site of the pumping plant, and the cost of the new transmission line would be amortized the first year of operation. The State of Utah would own a three mile transmission line facility between the substation and the delivery point, and the cost of the power line is included in our proposal.

The Environmental Impact statement indicates operating costs of approximately 4 million dollars per year. Using electrical energy, the operating costs are reduced substantially (approximately 30%) because of the favorable variance between electrical power and diesel power. In addition, the routine maintenance is less using electric motors over diesel drives.

We would propose two methods of payment, either of which would save the state over 6 million dollars over a two or three year period of operating the pumping station.

We understand from the proposed plan that the State is presently considering, the pumping station cost is 15.41 million dollars with a yearly operating cost of approximately 4 million dollars or a three year cost of 27.4 million dollars.

Response

17-1 As noted in Chapter 2 of this final EIS, the State has considered electrical power for the pumps.

No response required.

Comment Letter #17

Our Proposed Payment Method I

We would design and construct the pumping station and when construction is complete there would be an operational charge for acre feet pumped at the following rates:

$8.67 per acre foot the first year

$6.58 per acre foot the second year

$2.25 per acre foot the third year

The above rates are figured pumping a minimum of 1.2 million acre feet per year thus the cost each year is as follows:

Year 1	$10,400,000
Year 2	$ 7,900,000
Year 3	$ 2,900,000
	$21,200,000

This results in a savings of 6.2 million dollars.

Our Proposed Payment Method II

We will design and construct the pumping station including the delivery of power to the site for a guaranteed maximum price of 12.4 million dollars. Payments to be made monthly as work progresses. We will operate and maintain the plant for an average cost of $2,800,000 per year including the power cost. The costs for three years are as follows:

Initial Cost	$12,400,000
1st year pumping	2,700,000
2nd year	2,800,000
3rd year	2,900,000
Total	$20,800,000

This results in savings of $6,600,000.

It is our contention that we can construct a pumping plant with the capacity required in the EIS report dated February 1986, and operate the facility for three years at a substantial savings to the State. This plan also provides that with an award in June, we could be pumping full capacity by March 1987, one year before the present plan would take effect. Starting the operation in early 1987 should reduce the rising lake effect and its further damage on public and private properties.

Response

No response required.

Comment Letter #17

Response

We are available to meet at your convenience to further discuss this plan.

Very truly yours,

WEYHER/LIVSEY CONSTRUCTORS, INC.

Kent N. Wheelwright
Vice President Operations

WASATCH-DYNALECTRIC

Richard K. Bertoch
General Manager

cc: The Honorable Norman H. Bangerter
Governor, State of Utah
State Capitol Building
Salt Lake City, Utah 84114

The Honorable Arnold Christensen
President, Utah State Senate
891 East 8600 South
Sandy, Utah 84092

The Honorable Robert H. Garff
Speaker of the House
Utah State House of Representatives
551 Indian Springs Road
Bountiful, Utah 84010

Comment Letter #18

April 24, 1986

Mr. Jack Peterson
Bureau of Land Management
Department of Interior
2370 South 2300 West
Salt Lake City, Utah

Re: Salt Lake Flood Control

Dear Mr. Peterson:

Inasmuch as comment has been sought from the public permit me to suggest alternatives to pumping salt water from the Great Salt Lake:

18-1

Reduce freshwater inflow in the lake as much as possible. This would include consideration of more reservoir capacity in the canyons which drain into the lake and reduction of the inflow from Jordan River and other inlets.

Pump water from Utah Lake south and west of Utah Lake.

Advantages:

More freshwater in locations still available for irrigation, etc.

Relief of Great Salt Lake from some (all?) of its continually rising level.

Increased ability to control water resources for Salt Lake and Utah Valley.

Reduced damage from salt water on land west of Great Salt Lake.

Sincerely,

Wayne E. Wyler

Wayne E. Wyler
175 North Canyon Road, 6A
Salt Lake City, Utah
84103

After June:
3057 Bertis Drive
Sacramento, California
95821

Response

18-1 This alternative was considered and dismissed. Please review the discussion on page 65 of the draft EIS.

Comment Letter #19

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VIII
ONE DENVER PLACE — 999 18TH STREET — SUITE 1300
DENVER, COLORADO 80202-2413

APR 2 1 1986

8PM-EA

Mr. Jack Peterson
Bureau of Land Management
Salt Lake District
2370 South 2300 West
Salt Lake City, Utah 84119

RE: West Desert Pumping Project Draft Environmental Impact Statement (DEIS)

Dear Mr. Peterson:

In accordance with our responsibilities under the National Environmental Policy Act and Section 309 of the Clean Air Act, Region VIII of the Environmental Protection Agency has reviewed the referenced document. As we noted in our review of the advanced draft environmental impact statement, the document adequately disclose the significant issues related to the West Desert Pumping Project and alternatives.

Based on the criteria EPA has established for rating draft environmental impact statement, we have rated the West Desert Pumping Project as Category LO (lack of objections). We have not identified potential environmental impacts which would require changes to the proposal. If we can be of further assistance, please contact Dave Ruiter of my staff, FTS 564-1702.

Sincerely,

Dale Vodehnal

Dale Vodehnal, Chief
Environmental Assessment Branch
Policy and Management Division

cc: William Dickerson

Response

No response required.

Comment Letter #20

2741 Wanda Way
Salt Lake City, Ut. 84117
April 27, 1986

Mr. Jack Peterson
Bureau of Land Management
Salt Lake City, Utah

Dear Mr. Peterson

For some time I have had considerable concern that almost no one has apparently been showing an awareness over the fact that Great Salt Lake, particularly the southern portion, has been turning into what is approaching a fresh water lake. My understanding is that it has changed from around 24% salinity, to perhaps 5.5% at the present time. And it seems to be getting less salty as each year passes.

20-1 Not too long after the rail road causeway was constructed it could be seen that there was a considerable difference in the color of the two sections of the lake. And it was noted that the salt was migrating into the northern body. The south end was becoming less salty and the northern end was remaining high in salt content. I spent a few minutes sketching out the geography of the lake, and even though I am no expert in these matters, I believe I could see what was causing this. My attached sketch with the brief explanation show my conclusions.

The reason I am writing to you is that I understand that you have been assigned the responsibility of overseeing the development of an Environmental Impact Statement in connection with the proposed pumping of lake water into the western desert. I would appreciate it if I could submit a couple of points for possible consideration:

1) I feel that a large comparatively fresh water lake (the southern portion) would be a distinct advantage to the people of Utah. At the current rate of saline reduction I feel that it is possible for the southern portion to be as fresh as sea water in just a few years. If we could choose between having a "dead" sea or a life supporting "ocean" type lake right in our back yard I believe the choice is quite obvious.

2) The economic and recreational possibilities of a fresher type lake should certainly be considered as part of the impact statement.

Response

20-1 The respondant's concept of the salinity changes in the Great Salt Lake is not correct. A reveiw of Gwynn (1980) as cited in the EIS is suggested.

Comment Letter #20

20-1 If you will bear with me for just a couple of minutes more, let me explain why I believe we do have a choice over a "dead sea" or an "inland ocean type lake".

I believe we all agree that the southern portion of the lake is becoming less salty. I feel this is because:

1) Heavier than normal precipitation over the past few years has caused considerable dilution of the brine. This is obvious.

2) The causeway cutting the lake into two bodies of water has caused salt to migrate into the north body. Basically, this is because all of the major streams that empty into Great Salt Lake flow into the southern half. This results in a flow of water from the south half into the north half. This is salty water. As long as fresh water is coming in to the southern half, and salty water is running in to the northern half, the southern half will lose salt and become more fresh. This will apply even though we may have years of low precipitation. Normal evaporation loss is basically a function of surface area and should affect both ends of the lake equally, resulting in no significant migration of salt between the two bodies of water.

20-2 3) Lastly, and most importantly, if we pump water from the northern body of the lake, out into the desert, we can speed up this freshening process. Conversely, if we pump water from the southern body out into the desert, this process could be considerably slowed up and, in the extreme case, could even be reversed and cause the southern half to become more salty if we pump to the point where the brine from the northern portion started to flow into the southern portion. I feel that a flow from the north, bringing brine to the south should be avoided if at all possible.

I am not sure that I have adequately expressed my concerns, but I feel that we really do have a choice in determining the type of lake we will end up with, and I strongly urge that we should do everything economically viable to bring about the freshest type of lake on the southern end that we can. I would be happy to furnish additional information, or answer any questions that you or your people may have.

Thanks for your consideration.

Sincerely,

Dwaine A. Nielson

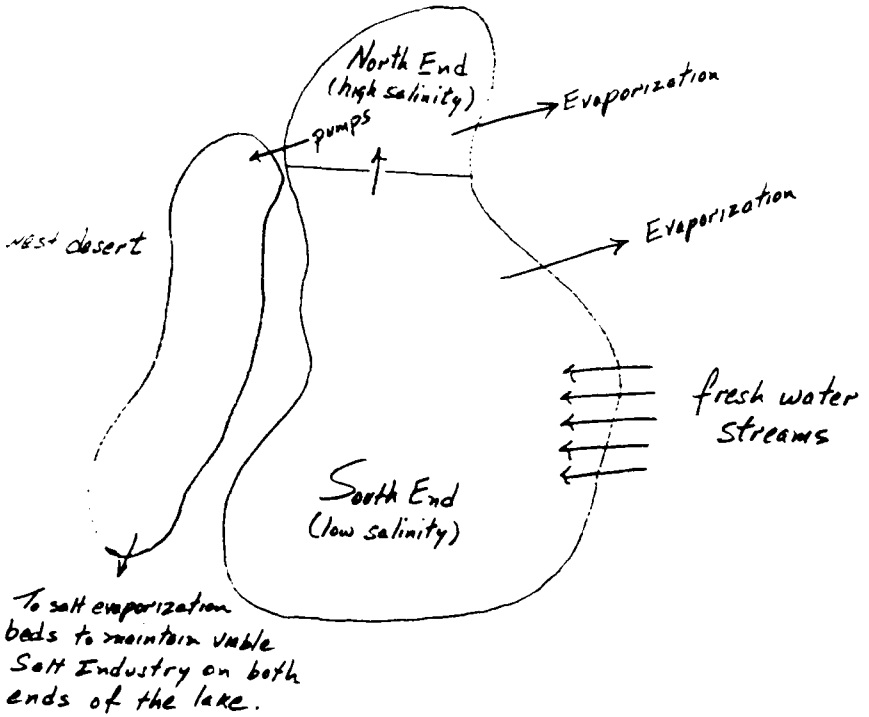
Dwaine A. Nielson
801-277-6178

88

Response

20-2 Please note in Chapter 1 of this document that the State has modified the West Desert Pumping Project to pump directly from the North Arm.

Comment Letter #20



Basically:

The major fresh water streams empty into the southern portion of Great Salt Lake. As the south end rises the water will flow in to the north end, through the opening in the causeway. This flow carries salt, in the form of brine, from south to north.

As long as the flow is predominantly in the south to north direction the south end of the lake will continue to become less salty.

Response

APPENDIX

United States Department of the Interior
FISH AND WILDLIFE SERVICE
ENDANGERED SPECIES OFFICE
2078 ADMINISTRATION BLDG.
1745 WEST 1700 SOUTH
SALT LAKE CITY, UTAH 84104

IN REPLY REFER TO

June 17, 1986

SE/SLC: 6-5-86-F-016

MEMORANDUM

TO: District Manager, Salt Lake District, Bureau of Land Management, Salt Lake City, Utah

FROM: Field Supervisor, Endangered Species Office, U.S. Fish and Wildlife Service, Salt Lake City, Utah

SUBJECT: Biological Opinion for the West Desert Pumping Project

This is in response to your letter of March 10, 1986, requesting formal consultation for the subject project. Your office determined that a "may effect" situation existed for the bald eagle (Haliaeetus leucocephalus) and the peregrine falcon (Falco peregrinus). Our comments have been prepared as prescribed in the Section 7 Interagency Cooperation Regulations, 50 CFR 402, and the Endangered Species Act (ESA), 16 U.S.C. 1531 et seq.

BIOLOGICAL OPINION

The West Desert Pumping Project is not likely to jeopardize the continued existence of the bald eagle and the peregrine falcon.

PROJECT DESCRIPTION (USDI 1986)

The State of Utah has filed for a right-of-way permit to use public and U.S. Air Force lands to prevent flooding around the Great Salt Lake due to rising lake levels. The project would utilize the Federal lands to construct a pumping plant and associated canals, and dikes to create evaporation ponds in the west desert of Utah. Water would be pumped from the Great Salt Lake (GSL) to the west desert ponds for evaporation.

The West Desert Pumping Alternative has been proposed by the State of Utah as their preferred means of providing immediate flood protection from any further rise of the GSL. This protection would be achieved by pumping water from the south arm of the lake and transferring it by a system of canals and pumps to two large evaporation ponds in the west desert. The project would be designed such that at least one million acre-feet of water could be evaporated on an annual basis. The brine solution remaining after evaporation would be circulated back into the lake to make it available to mineral extraction industries and to keep from filling up the relatively shallow evaporation pond areas with precipitated salts which would reduce evaporation. It should be noted that the description of this project is based on feasibility level design studies. Final design studies are in progress and will be incorporated into the FEIS.

In this analysis there are several options for the size, and thus location, of the ponds. The East Pond, which serves primarily to transfer brine back into the lake and secondarily to permit additional evaporation, has two alternative sizes or depths. The West Pond can be constructed in a "standard" form or as the larger Bonneville Pond, which floods a greater area and allows increased evaporation and associated flood control.

The effectiveness of this alternative would be dependent upon existing climatological conditions, initial lake level, and the operation of the pumping and transfer system. The Bonneville Pond alternative would result in a slightly lower lake level that would slowly decline to the year 2000.

BASIS FOR OPINION

Peregrine falcon

The peregrine falcon historically nested in nearly every State of the Union. Undoubtedly in North America its presence extended back thousands of years into the Pleistocene. Threats to the peregrine's existence in North America were vastly increased after human population expansion in the last century. This adaptable species thrived for many decades in North American and in the Old World despite extensive persecution by man and by human trespass against its habitat. But in the early 1950's, the breeding populations throughout much of the Northern Hemisphere began an unprecedented and precipitous decline (USFWS 1984).

The marked decline in active peregrine eyries and the greatly reduced productivity of peregrines in the Western United States since the late 1940's was coincident with declines elsewhere throughout the Northern Hemisphere (Hickey 1969). Ratcliffe (1969) indicated that although reliable evidence of trends in the British peregrine population is available only for the last few decades, it is far from certain that any great decline took place in Britain prior to the pesticide era. In the Eastern United States, Hickey (1942) reported that perhaps 10 to 18 percent of the historic sites were permanently abandoned by 1942.

In the area surrounding the Great Salt Lake, the peregrine falcon historically nested in the Wasatch Mountains and in the isolated mountain ranges of the West Desert. Currently, the only known peregrine falcon nesting occurs on the east shore of the lake as a result of the reintroduction program run by the Utah Division of Wildlife Resources in cooperation with the U.S. Fish and Wildlife Service. They have built seven towers around the lake as part of this program, two of which have been destroyed by the rising lake levels. However, three nesting pairs produced eggs in the remaining hack towers in the spring of 1986.

The population decline in Colorado has been halted by the current recovery efforts and the number of breeding pairs have increased from 4 in 1976 to 12 in 1984 (Craig in prep.). The current efforts include annual releases of young at 6 hack sites and augmentation of reproduction at 8 wild sites. Craig (in prep.) has shown through computer simulations that a reduction in hacking and augmentation will reduce the peregrine's chances for survival. These studies indicate that if peregrine falcon reproduction remains poor due to continued pesticide contamination then releases of young birds must continue to avoid extinction. Similar results would be expected to recover the peregrine falcon in Utah.

Impacts

An outbreak of botulism may occur due to the creation of ponds in the west desert. This disease has caused more massive waterfowl losses than any other. It may also affect peregrine falcons that eat waterfowl affected by the disease. Botulism is caused by a toxin produced by an anaerobic bacterium, Clostridium botulinum. The bacteria develop when high temperatures cause spores to germinate in a suitable nutrient medium, probably animal matter, and an environment devoid of oxygen (Bellrose 1976). Hunter et al. (1970) found that outbreaks develop as a result of one or more of the following conditions:

1. Flooding of dry land during warm weather, resulting in the drowning of terrestrial invertebrates that then provide a nutrient medium for the bacterium.

2. Receding water levels that expose mud flats, causing the death of aquatic invertebrates that also provide a suitable medium.

3. Changes in water quality that result in the death of invertebrate fauna.

4. Decaying animal carcasses that produce maggots.

Any one of the above conditions could occur naturally as the result of the continued rise of the Great Salt Lake.

The proposed pumping project would have no negative effect on the peregrine falcon and may prove beneficial since control of the lake level would prevent further loss of hack towers and destruction of wetland habitat which supports peregrine falcon prey species. Benefits would depend upon the amount of pumping done. If pumping only maintains the lake at 4,212 feet few benefits would be realized. If reduced to 4,205 feet, then considerable benefits would accrue.

Bald Eagle

The bald eagle (Haliaeetus leucocephalus) is a large, long-lived bird of prey restricted in distribution to North America. Adults, with their dark brown bodies, white heads and white tails are well known as the nation's symbol. However, the adult plumage is not acquired until age four at the earliest. Bald eagles go through a series of plumages prior to attaining adult coloration, and in some plumages the young bear a superficial resemblance to the golden eagle (Aquila chrysaetos) (USFWS 1983).

Wintering bald eagles occur throughout the country but are most abundant in the west and midwest. An abundant, readily available food supply in conjunction with one or more suitable night roost sites is the primary characteristic of winter habitat. The majority or wintering eagles are found near open water and they feed on fish and waterfowl, often taking those which are dead, crippled, or otherwise vulnerable. Mammalian carrion is an important alternate source of food at some locations. Also, many bald eagles spend a substantial portion of the wintering period in terrestrial habitats far from open water, relying on prey they can catch easily or scavenge, such as big game or livestock carrion and small mammals (USFWS 1983).

The bald eagle is a common winter resident in the State of Utah and the State has one of the largest populations in the nation. In the 1983 Midwinter Bald Eagle Survey sponsored by the National Wildlife Federation, Utah ranked second with a total of 1,042 birds. This amounted to almost 9 percent of the total U.S. count. A major bald eagle winter roost is in Willard Canyon east of the lake. Eagles concentrate there in the fall and spring, and feed on waterfowl and fish in the marshes along the lake. The rising lake levels have eliminated much of the wetlands and waterfowl habitat along the eastern shore but may have increased use of the area by freshwater fish.

The slight chance of botulism would remain as noted for the peregrine falcon. The Bonneville subalternative would have a slight advantage to eagles over the Standard West Pond alternative because reinstatement of important wetlands could begin sooner. Benefits would depend upon the amount of pumping done. If pumping only maintains the lake at 4,212 feet few benefits would be realized. If reduced to 4,205 feet, considerable benefits would accrue.

SUMMARY

The proposed project as outlined above will not jeopardize the continued existence of the bald eagle or the peregrine falcon. A possible negative effect to both species is the slight chance of an outbreak of botulism however, botulism may occur as a consequence of the No Action alternative as well as the two other alternatives and therefore could occur with or without the implementation of this project. A possible beneficial effect of the proposed west desert pumping project would be the protection of wetlands and hence the prey base for both the peregrine falcon and bald eagle. In addition, the reduction of lake levels would protect the peregrine falcon hack towers on the east shore of the Great Salt Lake which are essential for the recovery of this species.

REFERENCES

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Hickey, J.J. 1942. Eastern population of the duck hawk. Auk 59: 176-204.

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